

# THE IRON AGE

A Review of the Hardware, Iron, Machine and Trades.

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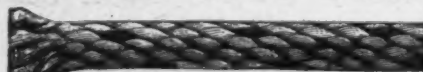
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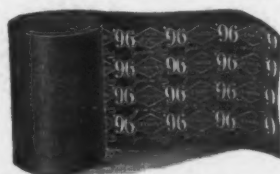
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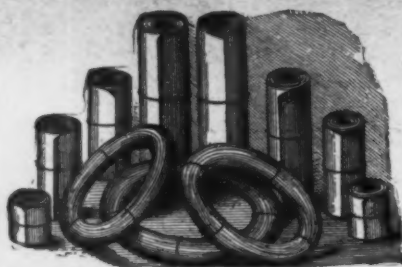
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# THE IRON AGE

THURSDAY, MAY 23, 1901.

## The First Large Turret Lathe.

BY THOMAS COULTER, BRIDGEPORT, CONN.

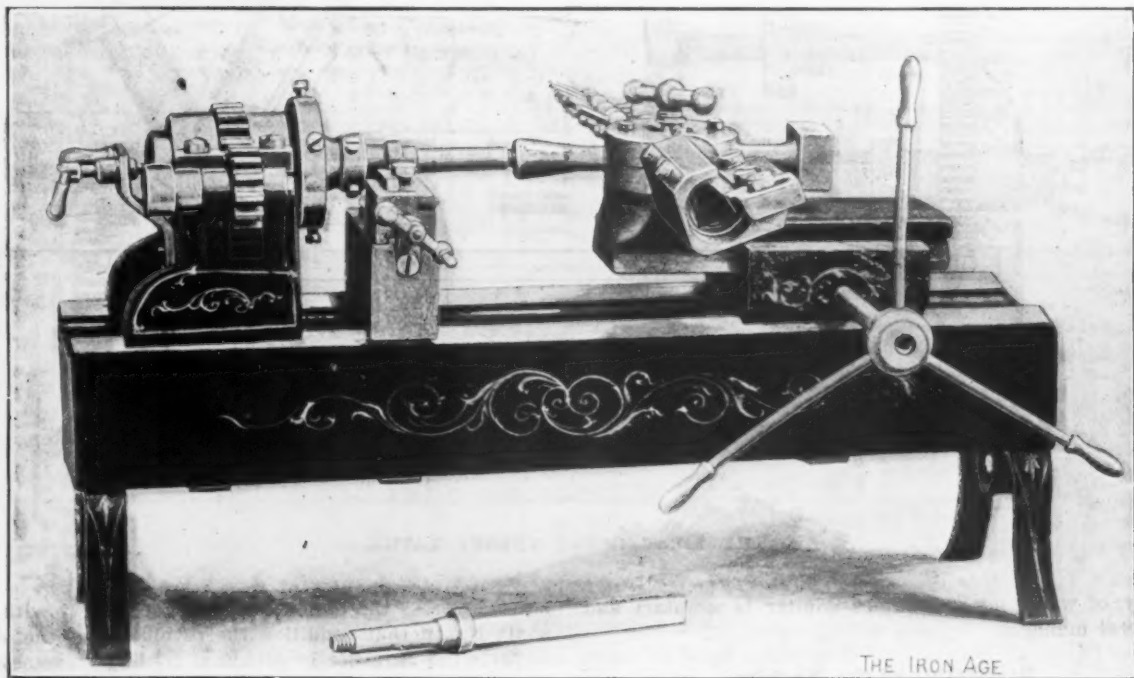
Thinking that it might be of interest to you and your readers to hear something about the first real large turret lathe or turret machine that was ever built or used in this country, or, I believe, in any other country, I send the following account:

The inventing and marketing of this large machine went through the usual hardships and knockdowns of inventors generally, particularly in the years 1872 and 1873. At that time we, Thomas Coulter and Hector McKenzie, were in the employ of the Howe Sewing Machine Company, and while there conceived the idea of making a machine that would take a wagon axle and finish it complete before being removed from the machine. Our

late one instance: A prominent axle maker in New Haven was shown the machine. He seemed interested, and wanted some six months' time, more or less, to decide. We granted his request, and waited anxiously the expiration of the time, but not hearing from him I thought it proper to call on him, and if necessary explain anything that he might wish to know. So off I went to New Haven, thinking that he must be interested; if not, hoping that I might be able to show him what could be done with such a machine.

I arrived at the house in due time; called for him at the door; was told he was in the hothouse among the flowers, and would I like to go and see him there. I gladly consented; was warmly received, &c.

I said that I had called to see what he had done about the axle machine. After a little while he said: "Well, sir, I would not give you 10 cents for your patent." I



THE FIRST LARGE TURRET LATHE.

means for carrying out such an undertaking were very limited. We hired a room in a convenient place and went at it nights after working hours. Some of the work we had to get done for us by machine shops.

The first machine had a wooden bed and legs, which were ornamented with beautiful scrolls, as shown by the accompanying engraving. After a long and hard struggle we finally got it so that we could turn out an axle. Then we had to get it protected the cheapest way that we could, the result being the filing of a caveat in the Patent Office. Now is when our real troubles commenced. There was the machine, but where was the man or concern to give it a start. We had no money; who had was the question. There being several axle shops in Bridgeport we applied to them. One said "Yes, you can have room here to put it up, and if we like it we will talk to you about it." We put it up, but they did not buy. They had excuses. We tried others. We had to explain that we could build a better one the next time, but it would cost more money. The result was that we could find no person to see it as we did, and we had no money to venture with the business of making them.

To show you what set backs we received I will re-

told him that I would take the papers and he could keep the 10 cents. I returned to Bridgeport with a heavy heart.

The machine had to be removed to Mr. McKenzie's cellar, and was there about a year. In the meantime I had changed my place of work to a regular machine shop, and while there my employer got a contract to make 10,000 sucker rods for pumping oil wells. He was changing his lathes, milling machines, and any other machines that he had in order to get out those joints, and was thereby injuring his other business for the want of these tools. While watching all this going on it occurred to me that I could do all this work on my axle machine. I said to him, "What will you give me if I finish a machine and do this work for you?" The result was that the machine was dug up out of the cellar, set up, and was making sucker rods in quick order, even with the wooden bed.

This gave us new courage to seek other axle makers, and among them was one in Philadelphia, who came to see us. The result of his coming was an agreement that we should get out a set of patterns, such as we thought best for a machine that would turn out 40 sets of axles

each ten hours, which meant 160 axle ends. We were to go to his shop in Philadelphia and build the machine. If any of your readers were ever in a wagon axle shop in the year 1877 they have an idea what tools we had to do with in the way of building a large turret lathe and have it finished in six weeks. We agreed to do all this on our part, besides granting to them the patent rights for Philadelphia and vicinity for which he was to give us \$600. We got the machine finished in the time stated, and got our money, after it was decided that "Philadelphia and vicinity" meant the four States of Pennsylvania, Delaware, New Jersey and Maryland. We then thought that a few more bargains like this would finish up our patent, and, sure enough, it did. We started to build a machine, but were so anxious to get orders for them that we did not get price enough, and finally sold out our remaining rights to Wheeler Beers of Bridgeport, for a house and lot valued at about \$2000, for which we realized about \$1200. Mr. Beers put the machine on the market and it proved most successful. After this I turned my attention to the making of carriage spring machines, of which there are a great many now in use. I am now president of the Bridgeport Automatic Machine Com-

a rotating tool holder, L, placed on the slide L'. A longitudinal movement is imparted to this slide by means of a shaft, N, turning a pinion formed in the slide. The holder may be held at any desired point by means of the screw I. At several points around the holder, as shown in Fig. 2, the tools for finishing the axle are arranged so that either may be turned into axial line with the mandrel. In order to secure the tool holders while in operation and hold them unvaryingly in their relative position a guide, P, is arranged on the bed, its upper surface being grooved, and surface of the several tools being formed with a rib, n, corresponding with the groove, so that before the advancing tool reaches its working point the rib will enter the groove and thereby form a guide as the tool is presented.

To feed the tools automatically there is arranged a shaft, R, on the side of the bed, which receives a slow rotary motion from the gears at the head. On this shaft, Fig. 2, is a worm, T, which engages with the worm wheel on the shaft N. On this same shaft is a sleeve between the gear S and the hand wheel r, which is arranged so as to have an axial movement on the shaft. When the nut t is turned it forces the hand wheel and sleeve forward

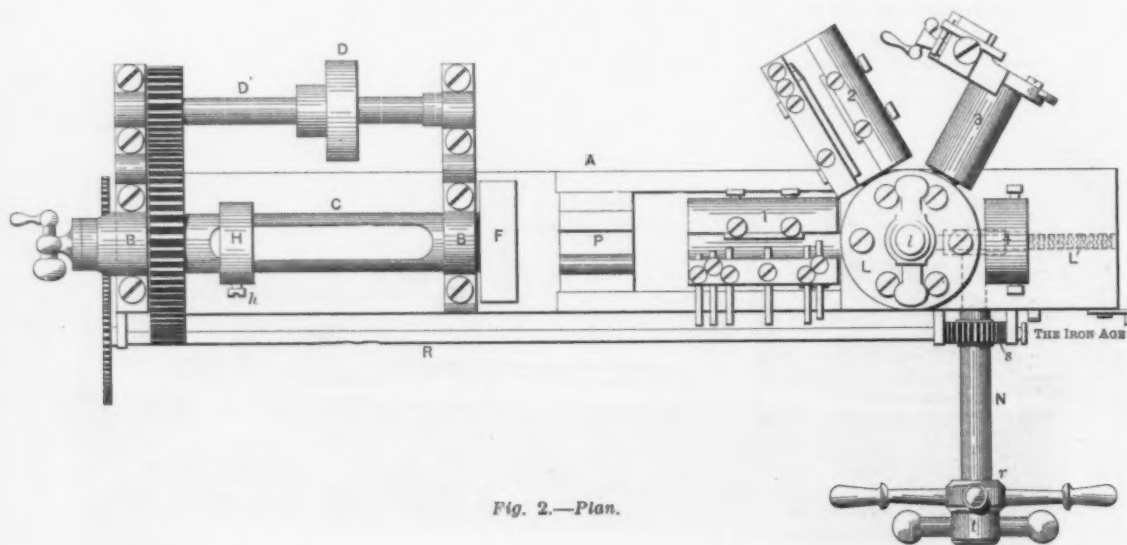


Fig. 2.—Plan.

#### THE FIRST LARGE TURRET LATHE.

pany, of which my son, James Coulter, is secretary and general manager.

##### Description of the Machine.

The first patent issued for this machine was dated February 17, 1874, and was entitled "Improvement in Machines for Turning Carriage Axles." A patent embodying improvements was issued on December 11, 1877, and from this we take the accompanying drawings and the following description:

At one end of the bed A is a mandrel, C, arranged in suitable bearings. This mandrel is driven through gearing from the pulley D. It is employed for the support of the axle, and is made hollow and open in one or two sides, so as to allow the body of the axle to be introduced therein from the front end. Through the rear end of the mandrel is a spindle, a, Fig. 4, formed with the point or center b on its inner end. At the extreme rear end is a fixed nut, d, threaded to fit a thread on the outer end of the spindle, this nut being provided with a suitable handle by which it may be turned to move the center in or out. The inner end of the mandrel is furnished with a chuck, F. A collar, H, is placed on the mandrel, along which it may be easily moved and held at any point by the set screw h. The inner end of the spindle a rests in this collar, hence if the body of the axle be short and the center thrown far enough forward to meet it, it will be supported by the collar and the inner end of the axle will be held firmly.

On the bed and in line with the axis of the mandrel is

so as to press the pinion firmly and couple it with the shaft N. In that condition the revolution of the shaft imparts the requisite longitudinal feeding movement to the slide L, but when the nut is released the slide may be moved freely and very rapidly by means of the hand wheel r. Hence it may feed slowly while doing its work and be quickly returned thereafter.

In order to arrest the tool when it shall have done its work a clutch, u, Fig. 3, is arranged on the shaft R, to engage the worm T, and from this a lever w extends upwardly. On the slide is an adjustable stop, x, which, when the slide is moved forward to the predetermined distance, will strike the upper end of the lever, disengage the clutch and stop the revolution of the worm. This enables a single workman to attend to several machines.

The Fox Machine Company, Grand Rapids, Mich., are exhibiting their products in Block 38, Machinery Building, at the Pan-American Exposition, Buffalo. They have a space 16 x 18 feet, in which they are exhibiting iron and wood working machinery, sash pulleys, and typewriters. Their iron working tools comprise milling machines, multiple spindle drills, shapers, punch presses and bicycle tool machinery. Their wood working tools comprise wood trimmers, miter machines, dado and grooving heads, and sash pulley inserting tools. The inserting tools comprise boring machines, quadruple bits and triple bits. The company have for some time been manufacturing the Fox typewriter, which forms a conspicuous part of their exhibit.

### The Plans of the Colorado Fuel & Iron Company.

The following statement of the plans of the Colorado Fuel & Iron Company has been issued by J. C. Osgood, the president:

The improvements in the steel plant of the Colorado Fuel & Iron Company, which were provided for by an issue of \$12,000,000 of common stock authorized by the stockholders September 25, 1899, are rapidly approaching completion. The first furnace, which will double the pig iron output of the company, is about ready to go into blast. This will be followed by two other furnaces in quick succession. The plan, as outlined to the stockholders in the circular addressed to them at the time the meeting was called for the increase of the capital stock, provided for the increase of the company's steel product from 150,000 to 600,000 tons, or four-fold.

It was also stated at the time that it would be desirable for the company to convert a portion of this increased product into more finished products, such as tin plate, wire, nails, sheets, &c. In order to carry out these plans an agreement has been entered into with Blair & Co. of New York and the Illinois Trust & Savings Bank of Chicago, whereby they underwrite an issue of \$10,000,000 of 5 per cent. convertible debenture bonds. These bonds will bear date August 1, 1901, and will be convertible at the option of the holder into common stock of the company at par at any time after February

The Colorado Fuel & Iron Company will be operated in entire harmony with the United States Steel Corporation, and it is the desire of all interested parties that the existing pleasant relations shall continue.

The company have not adopted any new plans, and have simply provided for the natural growth of their business and the supply of finished products in the territory in which they have a geographical advantage. No negotiations for consolidation with other companies are pending or have ever been considered. The banking interests which have underwritten the debenture bonds will be given a representation on the Board of Directors, and other interests which have recently acquired large holdings in the stock of the company will also be represented.

The company will derive great advantage from the

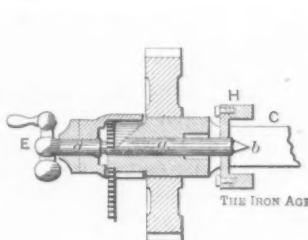


Fig. 4.—Section through Spindle.

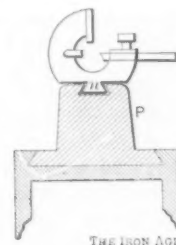


Fig. 5.—Section through One Cutting Tool.

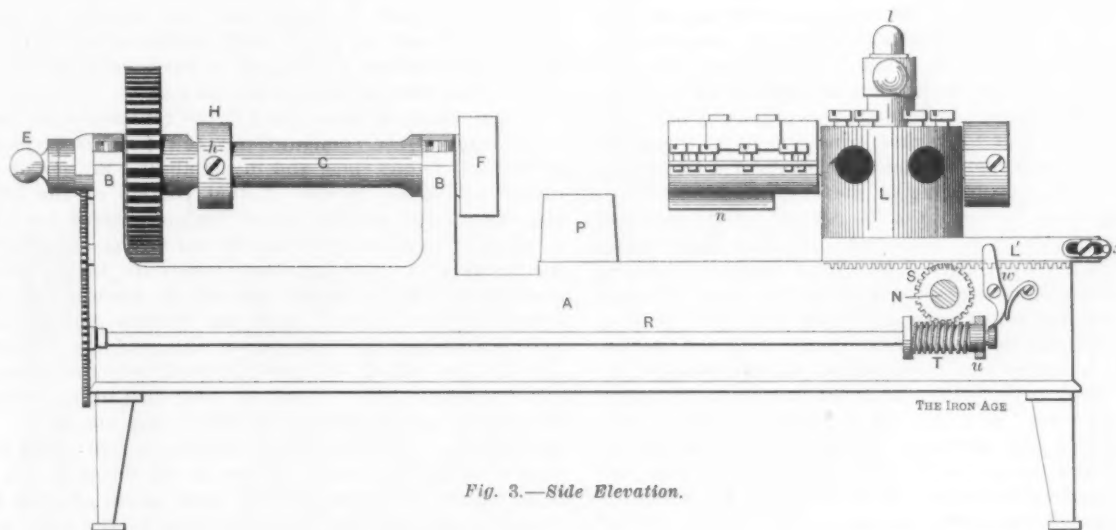


Fig. 3.—Side Elevation.

THE FIRST LARGE TURRET LATHE.

1, 1902, and until and including August 1, 1906, and redeemable at the option of the company at a premium of 5 per cent. on any interest day after August 1, 1906, and will mature August 1, 1911, and will be a part of a total authorized issue of \$15,000,000 of debentures. The \$10,000,000 of debentures will be offered at par, with an adjustment of interest, to the preferred and common shareholders of the company pro rata, according to their holdings, the offer to be open to the shareholders until August 1, 1901.

The purpose of the issue of the initial \$10,000,000 of debenture bonds is for the construction and operation of auxiliary plants to manufacture wire rods and plain, annealed and galvanized wire of all kinds and sizes, and also barb wire, field fencing, poultry netting, wire nails, tin plate, cotton ties, hoops, sheets, &c. The estimate for these plants, with a capacity of 300,000 tons per annum, is \$3,500,000, and it is assumed that \$1,500,000 additional working capital will be required.

The remaining proceeds of the bonds will be available for future enlargements of the plant, and will place the company in a very strong financial position. The proceeds of the remaining \$5,000,000 of debentures shall be used only for the acquisition of additional property.

knowledge and experience of the wire, nail and tin plate business which the gentlemen who have recently acquired stock undoubtedly possess. The issue of \$10,000,000 of debenture bonds will entail an additional fixed charge on the company of \$500,000 per annum. A conservative estimate of the additional profits to be derived on the finished products of steel referred to will undoubtedly result in a large increase of net earnings available for common stock dividends.

Among the recently licensed corporations of Illinois are the Benedict & Burnham Brass & Copper Company, with a capital of \$50,000, to deal in all kinds of brass and copper goods, comprising sheets, rods, wire, tubing and brass specialties. The company will maintain a warehouse and offices at 167-169 Lake street, Chicago, and these will be in charge of A. C. Dallas, formerly Western sales agent for the Benedict & Burnham Mfg. Company, Waterbury, Conn.

A school of technology is to be added to the other departments of the Northwestern University, Evanston, Ill. The school will comprise courses in electrical and mechanical engineering.



## The Passing of the Belgian Rod Mill.

The most conspicuous development in modern rod mill practice is the displacement of the Belgian or looping system of rolling by the continuous system. Without exception the new rod mills and those which have recently been most successfully remodeled, without regard to the size of billet used, are either mills of the pure continuous type or approach that type as closely as the experience of their designers will justify.

The purpose of this paper is not to disparage the important place the Belgian or looping type of rod mill has held, nor the great service rendered by those who have been instrumental in its successful development, but rather to record the fact and state the reasons for its giving way to a type of greater merit: A few years ago comparatively few people knew of or appreciated the continuous mill, but to-day 25, or about 70 per cent., of the rod mills in the United States are either continuous or semi-continuous mills.

Minimum cost of conversion is naturally the first demand of the rod mill owner. The principal items of cost, constituting from 50 to 70 per cent. of the total conversion cost, in which a reduction may be looked for are fuel, waste and labor—and in each of these the continuous mill has met and passed its veteran competitor with signal success.

### Fuel.

The use of fuel is confined to heating metal preparatory to rolling, and in generating steam for the requisite power. In heating billets no marked advantage can be claimed by either mill, since continuous furnaces are now used in both. First introduced and used in continuous mills, the later adoption of them has effected the most important reduction in Belgian rod rolling costs in the last decade. Recent continuous rod mills use billets 30 feet long of about 1½ inches square section, which are heated with less fuel per ton than billets of a larger section. Besides, the placing of the first stand of rolls of the continuous train close to the door of the furnace, and the rapid, successive reductions, without opportunity for cooling, do not require so high a degree of heat as in the case of the Belgian mill, where long loops of metal in process are continually giving up their heat on iron floors. "Strike while the iron is hot" is an old maxim, whose mandate was never more advantageously observed than in the rolling of metal continuously, and in this feature may be found the reason for a great saving in fuel for power purposes. In striking contrast to the low temperature at which rods are finished in the old Belgian or looping trains, the metal issues from the finishing pass of the continuous mill as hot as when it left the furnace, many indeed contending that it is actually hotter owing to the great amount of mechanical work done upon it and the very small interval of exposure to cooling. The metal is, therefore, as soft and mellow in the last pass as in the first, and the power required is consequently very much less than in the Belgian system. To speak more definitely, the power required to roll rods by the Belgian system is at the very least 50 per cent. more than that necessary to roll an equal tonnage in a continuous mill.

### Labor.

Repeating the hot metal from pass to pass in the old Belgian mill was very expensive. The partial use of mechanical repeaters in the modern looping mills has reduced this item one-half, but there is still required a large force of men, substantially all of whom must combine a high degree of skill with exceptional physical endurance. In the modern continuous mills no position is so severe as to require the "spelling" of employees.

The accompanying illustration shows a continuous rod mill of the very latest type designed by the Morgan Construction Company of Worcester, Mass. This engraving is made from a photograph of the mill while it was in actual operation, several billets having been rolled while the plate was exposed. It faithfully represents the kind of physical labor required of the operatives. The roller, seen in the background, has practically nothing to do excepting to make occasional adjust-

ments for wear. The boy, standing between the roughing and finishing mills, operates a flying shear, which crops the first end of the advancing metal to insure against split ends. The labor proposition in a continuous mill has been resolved to one of mere supervision, and on this account all the positions are filled by 12-hour men, none of whom require a man to spell them. In this connection it is interesting to note the recent starting of a new continuous mill in which there was but one man with previous experience in rod rolling, and but three men with experience in any kind of rolling. This mill reached the output guaranteed by the contracting engineers within a month of the time of starting, and marketable rods have been turned out from the beginning.

### Waste.

Under wastage of metal the two items to be considered are loss from oxidation and scrap. In the Belgian or looping system of rolling there is long exposure of the hot metal to the air between each pass, which results in the continual formation of scale or oxide, while in the continuous system this period of exposure is very much less. While as before shown in the continuous mill the rod is finished at a very much higher heat, it passes immediately into a bath of cooling liquid which floods the conducting pipe to the reels, and in its passage the temperature of the metal is reduced below the scaling point, but it is coiled hot enough that there is not the least hardening effect even in high carbon steel rods. Finished rods from the two types of mill under discussion will not differ materially in the amount of scale which appears on their surfaces, but the amount actually formed between the passes and cracked off or rolled in as the piece enters a new pass is very much greater in the Belgian than in the continuous mill.

Scrap losses are minimized in the continuous rod mill on account of the comparatively few number of pieces in the mill at one time, and in the ability, in case of accident or cobble, to cut off that portion of the billet (usually a large portion) which has not entered the mill, to return it to the furnace and to roll to a good rod after the cause of trouble has been removed. In the latest continuous mill but 40 per cent. of the piece is ever between the furnace and reels, and of this amount one-half is between the first set of rolls and the furnace, and can be cut off and pushed back into the furnace when desirable. It is, therefore, seen that no more than 20 per cent. of a billet can be lost at any one time. A peculiarity of rods rolled in a continuous mill is the formation of fins on both ends due to the unequal pull at these points. These finned ends must be cut off, and are a source of loss, but improvements in the mill and the rolling of larger weights have cut this item down to less than one-half of 1 per cent. of the weight of the billet, and made it possible to reduce the total loss from scrap and oxidation below the best Belgian mill practice. In a Belgian mill, where a man is obliged to handle a number of different pieces of metal at frequent intervals, a single interruption, as the failure of a bar to enter properly, will often cause not only the loss of that piece, but of several others which are oncoming.

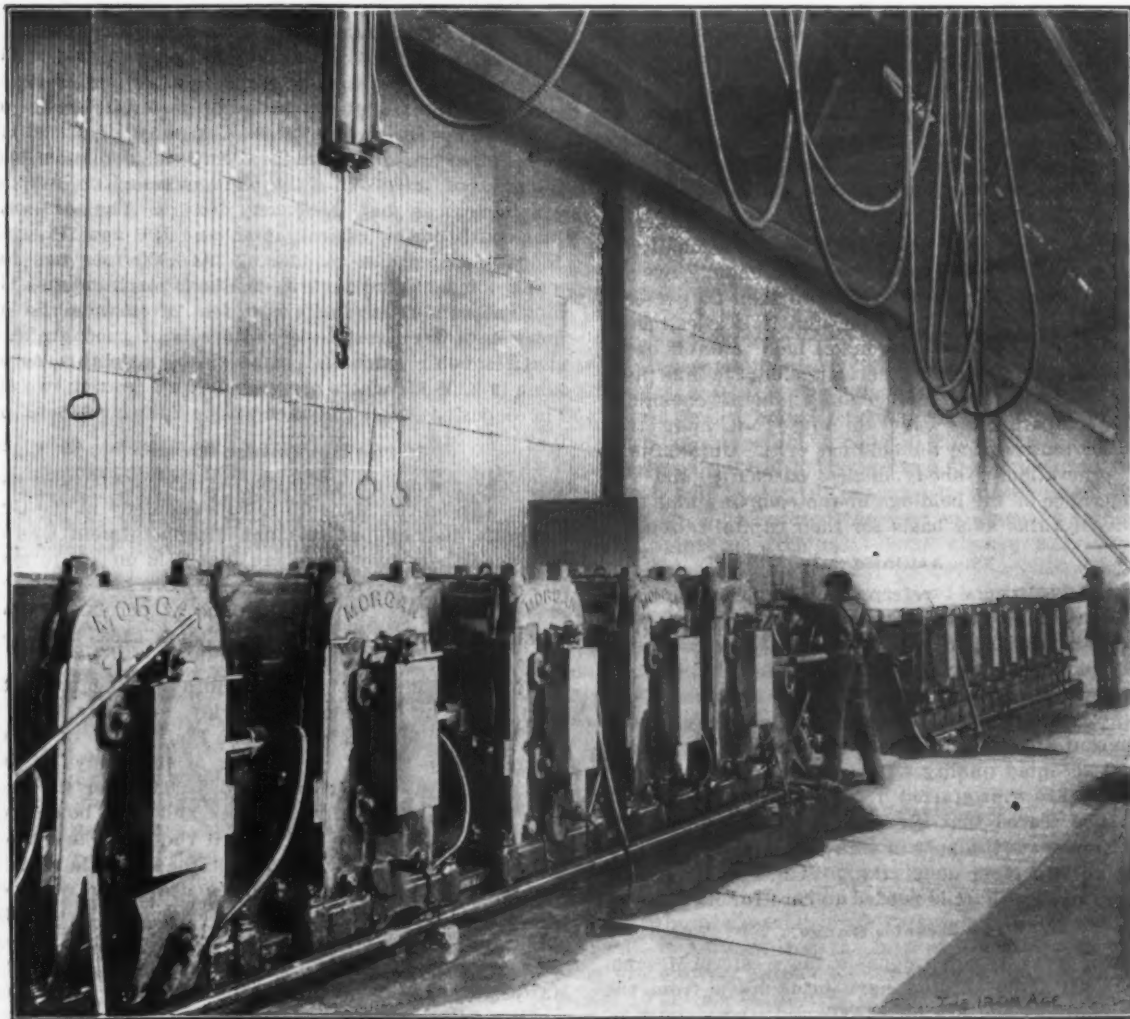
### The Quality of Rods from a Continuous Train.

A wire rod is seldom used as a finished product, it being but an intermediary article in the manufacture of wire. It is therefore desirable in the manufacture of rods to give full consideration to the requirements of the wire drawing department, since low cost for rods alone does not necessarily give ultimate minimum cost of finished wire. From the standpoint of the wire drawer the rods should be uniform in temper, soft, uniform in gauge and in long lengths, to produce the best quality of wire at the lowest cost. In each of these qualities continuous rolled rods are superior to the Belgian. Uniformity of temper is of great importance in high carbon steel wire, such as is used in the best grades of fencing, steel springs, card and music wire. In the pure Belgian mills or in those having continuous roughing and Belgian finishing trains the difference in temperature at which the first and last ends of the rod are rolled is great, and re-

sults in serious variation in the physical properties of each coil of rods. As is well known, the metal is so disposed in the loops of a Belgian mill that the last end is cooled for a period equal to the length of time required to pass the entire length of rod through the finishing pass. The pure continuous mills are so constructed that there are no loops whatever between the different passes, and practically all of the metal not being worked on by the rolls is either within the furnace or lies finished on the reels. Since the last end of the bar passes from the furnace to the finishing rolls in the same length of time as the first end, perfectly uniform heat conditions prevail, and rods of uniform temper necessarily result. Since the softness or ductility of steel rods is affected by the temperatures at which they are finished it follows that rods having one end rolled hot and the other

ing 300-pound bundles, and these bundles are not subdivided until after they have passed the first hole in the wire drawing room. The metal is not hand lifted from the time the billets are received until the first draft has been made in the wire drawing department. For shipment, if to be lifted by hand, the 300-pound bundles are cut into two or more parts, as desired. While the limit of weights which can be finished in a Belgian mill has long since been recognized as fixed, the weights finished in continuous mills have been gradually increasing and the end is not in sight.

**Delaware Manufactures.**—The Census Office at Washington has issued a bulletin showing the extent of manufacturing in the State of Delaware as ascertained by the census of 1900. The statement places the total



THE MORGAN CONTINUOUS MILL.

cold do not draw out into wire as easily as rods finished at a uniform heat from end to end. The comparatively small amount of power required to draw continuous rolled rods is well known to those who have used both kinds.

While it is most important for successful wire drawing that rods be soft and of uniform temper, it is equally desirable that they be rolled smooth and nearly round. No difficulty is experienced in meeting these requirements in a continuous mill where proper arrangements are made to deliver the metal to the rolls at a uniform temperature.

Rods in long lengths contribute to higher efficiency in the wire drawing room, because less pointing and drawing in is required than with shorter lengths. It has been found by experience that larger weights than 150 pounds cannot be successfully finished to No. 5 rod in a looping mill, while in a continuous mill the only limit of weight is what is deemed the best size of billet and bundle to handle. Several continuous mills are now roll-

ing 300-pound bundles, and these bundles are not subdivided until after they have passed the first hole in the wire drawing room. The metal is not hand lifted from the time the billets are received until the first draft has been made in the wire drawing department. For shipment, if to be lifted by hand, the 300-pound bundles are cut into two or more parts, as desired. While the limit of weights which can be finished in a Belgian mill has long since been recognized as fixed, the weights finished in continuous mills have been gradually increasing and the end is not in sight.

An order of the court fixes June 12 as the date for the sale of the Columbian Iron Works, at Baltimore, Md., and names William F. Frick and H. R. Preston as commissioners to conduct the sale. The Baltimore Shipbuilding & Dry Dock Company are being organized, with a capital of \$1,150,000, to buy in the property and enlarge its operations.



## Lake Iron Ore Matters.

DULUTH, MINN., May 19, 1901.—Ore cargoes are just now commencing to move. Other than United States Steel ships have been on the go for some time, and are now on their second trips; they are taking out grain with great rapidity, Duluth alone having shipped more than 2,000,000 bushels this week, but ore is scarcely started. The United States Steel ships are now arriving rapidly at docks, however, and by this time a week hence, nearly all will be carrying cargoes. The season has been cut just about a month by the various delays, and it will now be necessary for even greater hustling for the remainder than was indicated in my letter of two weeks ago, when it was figured that at least 65,000 tons a day must be the work of the Steel fleet all season through.

### The Outside Reserves.

There is considerable comment in the lake ore region on the statement of President Schwab to the effect that his company controlled practically 75 to 80 per cent. of the ores known to exist in the United States, and that they had ore for some 60 years. It is not believed that Mr. Schwab was correctly understood when he said "of the United States," but that he meant, it is thought, of the lake region. He is doubtless not very far wrong for the latter, though new discoveries are occasionally being made that may have a tendency to change the proportionate shares. Still there is more than 20 per cent. of outside ore in the lake region, and if it is estimated that there exist 1,000,000,000 tons of merchantable ore in the lake district on the American side the line as a whole—which estimate is certainly liberal enough—it will be comparatively easy to figure out more than 200,000,000 tons outside the holdings of the United States Steel Corporation. Nobody denies, of course, the vast preponderance of the holdings of the company and their magnificent value as a basis for their capitalization.

### The Ashland Sale.

Several weeks ago I referred to the price put upon the Ashland mine, foreshadowing a sale thereof. That sale has now taken place, as expected. It is for a price of about \$2,500,000, a compromise between Hayes Bros. and the buyers, who are said to be the Cleveland-Cliffs Company. The mine is an excellent property, better now than at any time in its history, and its ore is of a high and accepted quality. The Atlantic mine is suffering from a fire that started a day or two ago in No. 2 shaft. It is feared that a serious fire is in progress in the mine. Newport mine will sink a shaft in the quartzite foot, an important undertaking. The mine is looking well and the new shaft is needed to care for its product.

### The Mesaba Range.

A lot of work is being done in the western Mesaba. There 12,000 acres of land have been taken from the Walker holdings and are to be explored; the vicinity of the Mesaba Chief mine is being examined; the Marble lands in 18, 19 and 20, 56-23 have been taken by Oscar Rohl, representing the Union Steel Company of Pittsburgh, and an exploration has already commenced; the work at Buckeye, Diamond and Arcturus, in 56-25, is progressing well, and other lands are being taken for early work. So far not very much of value has been found in the general neighborhood, but perhaps it is too early to expect any valuable finds.

There are now some 65 diamond drills working on the Mesaba range, more than at any prior time in its history. Of these, two contracting firms have 44, the Oliver Company five, all east of the Duluth & Iron Range road's main line; the Minnesota Iron Company four, two east and two at Hobart; Sweeney two, near Hibbing, and the Eastern Minnesota road six on lands of their own or under option.

At one new find near Hibbing they have run into very hard ore at a depth of about 200 feet from surface, and under 135 feet of soft Bessemer. This sort of find near Hibbing is unprecedented, and is unusual for any part of the Mesaba. At this property they have found excellent ore under taconite. In one hole they drilled five

layers of taconite, the thickest of which was 23 feet. In this connection it is well to point out, in order to avoid misunderstandings on the part of those that might be otherwise misled, that in a recent interview at Pittsburgh with one of the officials of Jones & Laughlins, he was made to state that they were now finding ore on the Mesaba under the greenstone, where they had not looked for it, and that this increased the possibilities of the range tremendously. He doubtless meant taconite, for nowhere on the Mesaba has ore been found under the greenstone. The finding of ore under taconite has been frequently noted in this correspondence for the past two years and the overwhelming importance of the new knowledge has been frequently pointed out.

The Commodore mine at Virginia has been closed and threats have been made that the pumps would be pulled. The mine drains the Virginia basin, and will continue to do so until the new Columbia (Jones & Laughlins) has gained depth. Its flooding would result disastrously to Union and the Franklin group. The Commodore will probably not be started up till concessions have been made by those interested in the fee and the water. The Union Steel Company of Pittsburgh have taken an option on the Pennsylvania lands, being the N.E. of the S.W. of 20, 58-19, where it is supposed by the lessees that there may be ore. The location is just south of the Sharon mine and the new Itasca of Jones & Laughlins. A find of 2,000,000 tons has been made about half way between Stevenson mine and Hibbing village, under but a few feet of surface. Several holes have been sunk and the ore is of good grade. A shaft is being sunk on a State lease adjoining Alpena mine in 6, 58-17, where ore was shown a year or two ago. The deposit is a continuance of the Sauntry-Alpena ore.

### The Menominee Range.

There are many promising small explorations now under way on the Menominee range, chiefly in the Crystal Falls district, but so much disappointment was experienced there two years ago that it is unsafe to make any predictions of what may result. Ore has been found at several points, with indications of permanence and value, and the explorers are in most cases much encouraged.

The old Platt exploration, south of Negaunee, has been taken by Braasted & Sporley, and they have already quite a force at work. The Platt is one of the unfortunate experiments in mining of the Eddys of Bay City. It is stated that they paid \$200,000 for the property. It was practically valueless and they bought the Penobscot at Hibbing and moved the Platt machinery there. There is much activity in the Cascade district, and several of the old properties are being reopened. Lands near the old Magnetic and Klomen mines at Republic have been taken for exploration and will be entered at once. Shipments are going forward rapidly to Marquette and the vessels are now arriving with great rapidity. Both the roads have their full summer schedules in force, and from now on there will be the greatest activity.

Track laying has been completed on the Eastern Minnesota road's short line to the central Mesaba, and ore will be hauled that way soon.

The Marquette & Southeastern road (Cleveland Cliffs) are employing 350 men in the construction of their line from Marquette to the Munising railway, which are also owned by the mining company. The new line will open hard wood lands, valuable for charcoal and timber purposes.

Track is being laid on the Algoma Central northeast from the Helen (Clergue) mine to the Josephine, which will be delivering ore at Michipicoton harbor in two or three months.

The Chicago, Milwaukee & St. Paul Railway have made contracts with a number of mines in the Crystal Falls and other Menominee districts to handle a part of their ore to the new docks at Escanaba. They have less of the United States Steel Corporation's Menominee ore than might be expected. In fact their total tonnage for the year will probably be comparatively small.

Oglebay, Norton & Co. have issued their pocket book



of ore information for the year. It is a neat leather bound book, containing full analyses of the ores of the lake region, together with shipments for a series of years, and is most convenient to carry in the vest pocket.

D. E. W.

## Notes from Great Britain.

Offices of *The Iron Age*, HASTINGS HOUSE,  
NORFOLK STREET, STRAND, W. C.

### Krupp and Indian Railways

An authoritative statement is made that a member of the firm of Krupp, with an expert locomotive engineer, is shortly leaving Essen for India, with the purpose of studying the Indian railway system. The directors of Krupp's Works seem to think that they might do a great deal in the way of competing for the supply of rails and locomotives to the Indian lines, particularly in view of the fact that many orders have recently gone to the United States. I am not surprised at this development, because I am convinced that in the engineering world India is bound to be a most valuable customer, not only to Great Britain, but also to Germany and the United States. At the first blush it would seem unwise at the present time to spend much money in India; but the economic condition of India is not so bad as appears upon the surface. The purchasing capacity of the poverty stricken native is, of course, contemptibly small, but in Government and official circles money is cheap, and will undoubtedly be utilized in the near future upon engineering works, bridges, electrical enterprises, and other ventures requiring mechanical skill and metal work.

### American Locomotives on Indian Railways.

Apropos of the visit of Krupp's representative to India, it is interesting to take note of the answer given by the Secretary of State for India in the House of Commons this week. The Secretary stated that the Government inspector of Burmah railways, in his report dated August 5, 1900, has noticed certain defects in the American locomotives supplied to the Burmah Railways Company. The report said to have been made by Mr. Johnson of the locomotive department of the company is not in possession of the India Office, but information which the Secretary of State for India has received does not lead him to think that the American locomotives on Indian railways have been found generally unsatisfactory, but in view of certain statements made by the *Board of Trade Journal* on the Burmah railway locomotives, he is asking the editor of that journal for the special information alleged to be in his possession.

### Traction Engines and Self Propelled Lorries.

There would seem to be a growing demand on the part of British officials for traction engines and self propelled lorries. The Financial Secretary to the War Office is chairman of a committee which is at the present time sitting to consider various reports received from South Africa on the utility or the reverse of mechanical transport. Various experiments are being made, and it is hoped that some satisfactory method of employing this kind of transport more extensively in the future will be discovered. I do not know if any American engineers have been consulted in the matter, but there is nothing to prevent them communicating with the Financial Secretary of the War Office, Pall Mall, London, S. W. With regard to self propelled lorries for military purposes, the Secretary of State for War offers three prizes of £500, £250 and £100 for the three self propelled lorries which shall be adjudged, after a series of trials carried out by the War Office Committee on Mechanical Transport, to be best suited to military requirements. The trials will begin on Wednesday, December 4, 1901, and will extend over a considerable period, so that the vehicles may be thoroughly tested. The exact nature of the trials will be determined upon by the above mentioned committee. A general scheme will be drawn up and issued as soon as possible to all intending competitors, but the committee reserve to themselves full powers to carry out any additional tests they may deem necessary, whether included in the general programme or not. The committee reserve

to themselves the power of rejecting any vehicle which does not comply with the published requirements, or of suspending at any stage the trials of any vehicle which in their opinion has proved itself unsuitable. The decision of the committee as to the comparative merits of competing vehicles will be final. Firms or individuals who intend to enter for this competition must send in their names to the Secretary, Mechanical Transport Committee, War Office, Horse Guards, Whitehall, London, S. W., on or before September 1, 1901. No vehicle will be admitted to the trials unless a fully dimensioned set of drawings and a specification, giving complete details of the lorry and trailer exactly as submitted for trial, together with a statement of the purchase price of the lorry and trailer, have been lodged with the Secretary, Mechanical Transport Committee, before December 4, 1901, the date of the commencement of the trials. All designs and specifications lodged will be considered confidential. Those of the vehicles that may be purchased will be retained for the purposes of the Government, but without prejudice to patent rights. Those of vehicles not purchased will be returned to the competitors after the trials. Certain firms have already been asked to send in designs for a lorry for the consideration of the committee, and some have already communicated with the committee. It has, however, now been decided to institute an open competition. I may add that the War Office has issued a detailed statement of the requirements which the lorry is required to fulfil.

### A Dangerous Experiment.

The Government of New South Wales are inviting tenders for 100,000 tons of steel rails, manufactured in New South Wales, and to be delivered within four years. This involves the establishment of iron works in the colony. A deposit of \$50,000 is required as a guarantee that the works will be carried out, and it is stipulated that the price shall not exceed the cost in Great Britain or America, plus the freight. I have always understood that the great difficulty in the Australasian colonies is the effective assembling of the raw materials, and the latest information is that this is still regarded as an almost insuperable difficulty. Doubtless, however, the Government of New South Wales know their own business best. It may be that they *bona fide* believe that these works can be established, or it may be that they have some political object in view. Perhaps some American engineer might know how to do it.

### Back from the States.

Colonel Hughes of Sheffield has returned from the United States. Your readers are doubtless aware that he went there primarily in the interests of William Jessop & Sons, who are establishing works at Little Washington, Pa. It appears that the firm of William Jessop & Sons are entirely satisfied with the site they have obtained. The representatives of this firm appear to have been much surprised at the number of applications offering them sites. Colonel Hughes says that they had sometimes as many as 50 applications a day. Colonel Hughes is well known to be a level headed observer of business, and his comments upon the steel trust are not without interest. He says: "Business in the United States is booming in every direction, and especially in the iron and steel trades. Factories and works of the largest dimensions are springing up rapidly, outside of the great steel trust, and in competition with it. My impression is that the people of the United States are very impatient of the steel trust, and are by no means so much inclined as are some people at home to think it is going to sweep the decks, and take the trade of the world. From what I could hear, at no time has there been so much individual enterprise as there is at present. For instance, while we were at Little Washington another steel works in a different class of business was projected, and a site was purchased adjoining Jessop's, showing that individual manufacturers in the States think the establishment of the steel trust gives them an opportunity of developing on their own account. There is no doubt American manufacturers are very much alive to the necessity of moving with the

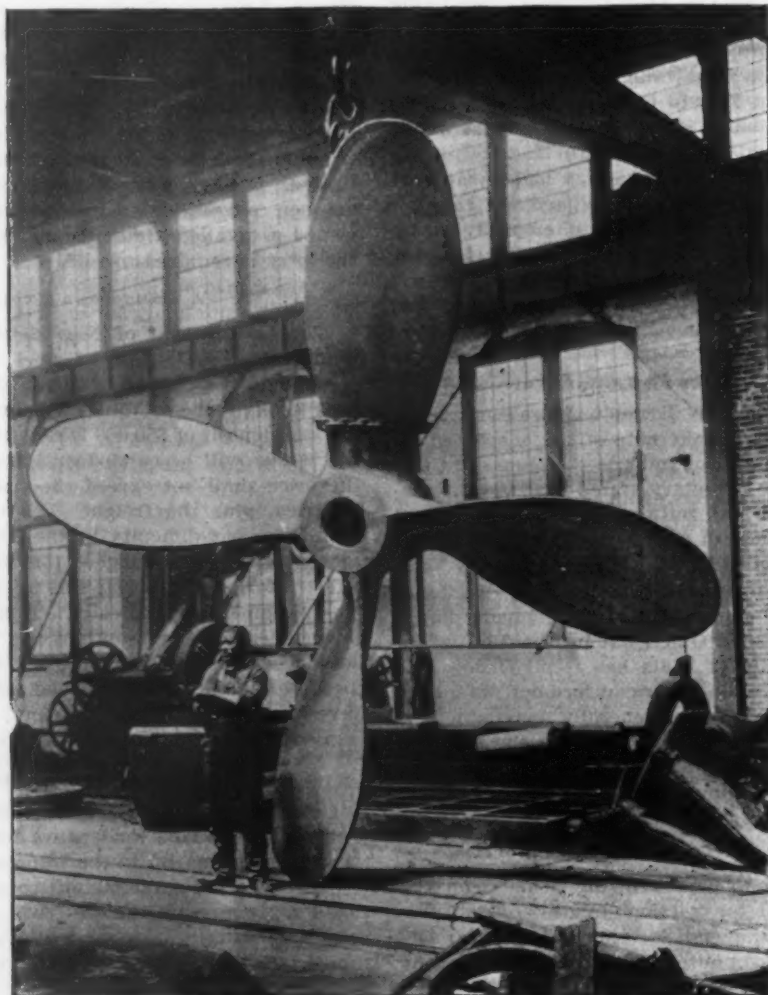
times. Both masters and men display an energy about their work which is perfectly refreshing to see after the more leisured habits of people on this side. The American workman seems to be animated by a desire to do as much work as he possibly can, to earn as much money as he possibly can, and to surround himself with home comforts." There is nothing very new in all this, but it serves to indorse many of the best criticisms that have been made with reference to the steel trust. Another point that struck the Colonel was the marked superiority of American railways and tramways.—S. G. H.

### A Large Propeller in Single Steel Casting.

A remarkably perfect steel casting was recently shipped from the works of the Seaboard Steel Casting

### Central Pennsylvania News.

HARRISBURG, PA., May 20, 1901.—An industrial boom of no mean proportions is upon Harrisburg. This city has never had so promising an outlook as at this time. In all lines of manufacturing activity, especially in the iron and steel trade, the future is bright, and the orders are so plentiful as to justify the important extensions to plants which are now being made. The reorganization and expansion of the Pennsylvania Steel Company means the erection at once of a large office building at Steelton and the addition of several large departments on the land recently acquired adjoining and east of the present plant. Definite plans have been adopted for the enlargement of the works and the plant, already five miles long from one boundary to the other, will be increased by the erection of not less than 50 new build-



LARGE PROPELLER IN SINGLE STEEL CASTING.

Company, Chester, Pa. The casting of propeller wheels in one piece is always a delicate operation, and it is very seldom that an attempt is made to mold one so large as that shown in the engraving. This wheel, which is for a repair job on the Old Dominion steamship "Jefferson," was shipped to the W. & A. Fletcher Company, at Hoboken, N. J. It is 17 feet in diameter and weighs a trifle under 19,000 pounds, and is as smooth and perfect as could be desired. It was molded from a pattern consisting of one of the blades and a half of the hub, and despite the fact that the flask was necessarily of such great size, the traveling cranes in the equipment at the foundry handled the work with ease, and the work of molding, drying, casting and finishing the propeller was completed in two weeks. The wheel was shipped on a Pennsylvania Railroad coal car, the hopper of which was removed so that one blade could project through the bottom of the car. In this way it cleared the bridges and tunnels en route.

ings. Already the huge skeletons of half a dozen large structures may be seen near Highspire. Steel for a dozen more is on the ground and no time will be lost getting these additions in shape for the departments which will occupy them. There has been a tremendous growth in the frog and switch and bridge and construction departments, and ten steel buildings for the first named department will be erected near Highspire. Other buildings for machine shops, electric power plants, and foundries will go up in the same locality. The machine shops will be large ones, and there will be a score of buildings for the bridge and construction department, the main building for this department being 2000 x 100 feet. Great improvements are planned for existing departments and there will be many extensions. Gas from the blast furnaces is being utilized and new electric plants are contemplated. Within 18 months the force of employees will be gradually increased from 7000 to 10,000.



The Pennsylvania Railroad Company have commenced work on the Market street subway in this city, and the Philadelphia & Reading Company are also about to begin important improvements, including a new passenger and freight station, and increased yard facilities. President Baer's plans contemplate an important terminal for Harrisburg.

All the industrial establishments in this district are crowded with orders and there is no cloud upon the horizon. Special activity is reported at the pipe mills.

E.

### Utilization of the Heat and the By-Products of the Blast Furnace.\*

**Waste Heat in Blast Furnace Working.**—There are two items of waste heat in our blast furnace operations which must be self evident to all who have watched the tapping of furnaces—namely, the loss of the heat contained in the iron and the slag. Taking the iron first, the results are as follows: Heat lost in 100 tons of pig equivalent to 4.125 tons of coal. Thus in a blast furnace plant producing, say, 100,000 tons yearly, the heat lost in the iron will equal 4125 tons of coal. The total make of the Cleveland district approximates 2,225,000 tons yearly, and the heat in this weight of iron will be equal to 92,800 tons of coal. If in all our various manufactures it were possible to use the whole of the pig iron made direct from the blast furnaces in the molten condition, in our foundries, iron works and steel works, the problem of utilizing this waste heat would be readily solved. Such a condition of things is not likely to occur for some years to come, and though we do at present use some of this 2,225,000 tons direct for the manufacture of steel, the amount so used is not a very large proportion. All the rest is cast into pigs, and the heat is lost. The problem to be solved, therefore, is how to cast the iron into pigs and utilize its heat also. The method of casting in sand is still by far the most universal one, and most of the iron so cast is judged by fracture as regards quality. Judgment by fracture only is, however, decreasing in importance; the composition as shown by analysis is considered the best guide. Hence casting in sand might be done away with, and some method of casting adopted which would utilize some of the heat now allowed to go to waste.

The heat in the slag is a more serious item of waste than in the case of the iron. A furnace working on Cleveland iron stone produces 30 cwt. of slag per ton of pig, or 150 tons of slag to 100 tons of iron. The heat in 150 tons of slag is equivalent to 10.3 tons of coal. Thus in a blast furnace plant producing 100,000 tons of Cleveland pig yearly, the heat lost in the slag will be equivalent to 10,300 tons of coal. The total make of Cleveland pig approximates 1,300,000 tons, carrying with it 1,950,000 tons of slag. Add to this 720,000 tons of slag produced in the manufacture of other kinds of iron, and we get a total of 2,670,000 tons produced yearly in the Cleveland district. The heat in this weight of slag is equal to 183,340 tons of coal, and if we add to this the loss in the iron, the total amounts to 276,140 tons, over a quarter of a million. At 10 shillings per ton this is equal to £138,070, representing the value of the waste heat in the iron and slag of the Cleveland district. It would, of course, be impossible to recover all this waste heat and apply it to some useful purpose, but a large proportion of it should be reclaimed—a problem for metallurgists and engineers to solve.

As far as I know, only Sir Lowthian Bell in this country has attempted to utilize the waste heat in the slag. Some years ago he took out two patents, the first being as follows: The slag ball was run into a bath of water under a salt pan, the steam rising underneath the pan and heating the brine. This was not successful. In the second patent the slag balls were run into a brick lined chamber, the roof of which was a salt pan, and the exhaust steam from the blast engines was turned into this chamber. When the balls were in the temperature rose to 500 to 600 degrees F., the steam before going in be-

ing about 212 degrees. This was sufficient to evaporate the brine, and for some time salt was manufactured in this way. The brine contained 22 per cent. of salt, the pans were 20 feet square, and 44 to 47 pounds of salt per square foot of pan was made. This was also abandoned owing to the action of the heat on the bogies, as the chamber acted almost like a soaking pit, and also if a ball burst inside, it practically meant cooling down the chamber so that men could go in and clear away the destruction. This naturally meant a stoppage of the pan during the cooling down and clearing of the chamber.

There is one direction in which the heat of the slag might be utilized—that is, in the drying of wet ores which are used direct in the blast furnace. The ores from Bilbao often contain over 10 per cent. of moisture. Taking the percentage of moisture in the mixture used for the furnace charge at 8 per cent., there will be 3.04 cwt. of water in the 38 cwt. of ore required to make a ton of hematite pig iron. The evaporation of this water will use heat equivalent to 0.407 cwt. of coke as burned in the blast furnace. This means 2.35 tons of coke per 100 tons of pig, or about 18½ tons per furnace per week. If we could dry these ores by the waste heat of the slag not only should we save coke, but the furnace would work much more freely. When the ores are wet and in a sticky condition a perfect mixing of ore, coke and limestone in charging is not easily attained, the ore remaining in sticky masses, causing irregular working and liability to hanging. Also the gases are so full of steam that they burn very badly, and where a plant is making nothing but hematite pig it is often difficult to keep up full steam pressure without firing the boilers with coal to a small extent.

This question of waste heat is one which touches all departments of iron and steel manufacture, but what I have said above shows very clearly that in blast furnaces alone there is a mine of wealth in waste heat waiting for some one to successfully tap. This is certain, that the time will come when it will be a problem which will have to be tackled and solved if it is possible to do so.

**Utilization of Waste By-Products.**—The principal by-products of the blast furnace are gas and slag. The former has for many years been successfully applied for heating stoves for the hot blast and raising steam for the blowing engines, pumps, lifts, &c. Seeing that in a well appointed plant the waste gases are sufficient to supply all the needs of the working of the furnaces, it would seem at first sight that this waste product is being fully utilized. But the problem of using this gas in gas engines, and so producing power direct, has of late years engaged the minds of engineers and metallurgists at home and abroad. Though more experimental work in this direction has been carried on abroad than in this country—notably by the John Cockerill Company of Seraing—it is only fair to mention that one of our vice-presidents, James Riley, was one of the first to apply in a practical though limited way Thwaite's system of utilizing the power in the gases at the Wishaw blast furnaces of the Steel Company of Scotland some six years ago. In the last two years we have had two papers on the subject by A. Greiner, member of the council, and the new system appears to have derived a great impetus by the success of the gas engine, which was shown by the Cockerill Company at the Paris Exhibition. In Mr. Greiner's first paper he quoted figures showing a surplus of 2000 horse-power per 100 tons of daily make of pig iron, which, in order not to be over sanguine, he reduced to an estimate of 1000 horse-power per 100 tons of pig. In my firm's plant of three furnaces at Thornaby the figures work out as follows:

Total gas per hour, 2,628,000 cubic feet. Half of this is used by the hot blast stoves, and about 239,000 cubic feet by the boilers which supply the gantry lift, leaving 1,075,000 cubic feet for raising steam for the blowing engines, pumps and furnace hoist. Taking the requirements of a gas engine at 130 cubic feet of gas per horse-power per hour, this 1,075,000 cubic feet of gas is capable of producing 8269 horse-power. The horse-power of the blast engines, pumps and furnace hoist engine total

\*From the address by William Whitwell, president Iron and Steel Institute.



1388, leaving a surplus of 6881. Taking an ordinary day's make at 350 tons, this gives 1900 horse-power per 100 tons in favor of gas engines. This calculated result comes out very close to the figures quoted by Mr. Greiner, but if to be on the safe side we take his reduced estimate of 1000 horse-power as the surplus, we get a wonderful result when taken over such a district as Cleveland. The make per day approximates 6100 tons, and at 1000 horse-power per 100 tons we have a surplus of 61,000 horse-power, equal to the consumption of more than 500,000 tons of coal per year. The uses that this power might be put to are endless, driving all the machinery in the works, and supplying electric light and power for outside consumption. Though this problem of utilizing blast furnace gases is not yet completely solved, I feel certain it very soon will be, and we may see the day when, as my predecessor somewhat humorously suggested, our blast furnaces will be power producers, with the pig iron a by-product.

We can now arrive at an estimate of the waste going on in the blast furnaces of the Cleveland district. Horse-power in the gases, 61,000; waste heat in the iron and slag, equal to 276,140 tons of coal, or 31,500 horse-power; total power going to waste, 92,500 horse-power.

The horse-power of Niagara Falls is estimated at 7,000,000. The amount at present supplied by the Niagara Falls Hydraulic Power & Mfg. Company is about 30,000. Our waste, then, may be looked on as a small Niagara, which, if we could see it in the form of a waterfall, would very speedily convince us of the enormous amount of energy being lost.

*Utilization of Slag.*—The total make of slag in the Cleveland district is 2,670,000 tons yearly. Many attempts in the past have been made to utilize it and turn it to some useful purpose, with more or less success; but the accumulation of slag goes on and great useless, unsightly heaps are extending in all directions. A stranger from the South of England passing by one of these huge slag hills one rather misty day caught a glimpse of it through the smoke and fog, and thinking it one of the famous Cleveland hills, was anxious to know the name of it. It certainly was a Cleveland "hill," but not such as he was thinking of. Many firms at Middlesbrough not having tipping ground have to send it out to sea at a cost of over a shilling per ton of iron.

The principal uses of slag at present are road metal and paving blocks, or scoria blocks, as they are called. It also forms the basis of artificial stone work and concrete flagging, but these consume only a small portion of the total make, and the problem is to succeed in the directions in which others failed in the past, and also, if possible, find other and more extensive means of utilization.

The setting properties of granulated slag or slag sand, when suitably treated, have long been known. In 1887 J. E. Stead read a paper before the Cleveland Institution of Engineers on "Hydraulic Cement from Cleveland Slag." The process he described consisted in mixing and grinding to an impalpable fine powder 75 per cent. dried slag sand and 25 per cent. slaked dry lime. The powder so produced is slag cement. In strength it compared most favorably with Portland cement, and there seemed every probability of the process being a success, and an important industry established. The main element in the success of the cement rests in the extreme fineness to which it is ground, and this proved the main difficulty, as grinding machinery was speedily destroyed by the slag sand. Since then, however, grinding machinery has been very much improved, and there seems no reason why this manufacture should not be taken up again and made a success. The Skinningrove Iron Company have given us a very practical example of what can be done with slag cement, for their shipping pier is constructed with this material. The important point about this pier is that the cement was made from ordinary slag, without any desulphurizing process being adopted, and contrary to the arguments as to the disintegrating effect of the sulphur, in the form of calcium sulphide turning to sulphate, and the speedy destruction of the pier in consequence. It shows to-day no such signs of decay.

For some years Wilsons, Pease & Co., under the di-

rection of Charles Wood, manufactured at the Cleveland Slag Works, Middlesbrough, bricks from slag for building purposes. Slag sand mixed with selenitic lime was pressed in bricks in a brick press, stacked under wooden sheds to air harden for seven days, and then in the open air for five to six weeks to further harden, at the end of that time being ready for the market. The selenitic lime was composed of 80 per cent. unslaked lime, 10 per cent. raw gypsum, and 10 per cent. iron oxide, and 6 cwt. of this mixture was used per 1000 bricks. Buildings constructed of these bricks 20 years ago are in a very good state of preservation at the present time, the bricks being both hard and tough. Many thousands were shipped to London. Their price was at that time 12 shillings per 1000, which did not leave much margin for profit; but seeing the present high prices of building materials, there would be a better chance of the manufacture proving remunerative. The appearance of the bricks is somewhat against them, being of a dull gray color.

Slag sand ground fine in a mortar mill with 6 per cent. slaked lime produces an excellent mortar. It sets rather quickly, a disadvantage in one way, as mortar left over the week end is useless on the Monday. T. Kirk of the Carlton Iron Company informs me that for many years he has not used any lime at all for mortar, all for his building operations having been made out of slag. He grinds together a limey slag and a quarter of its weight of old brick rubbish, with a few clinkers. A good pug mill is required, and it is essential that the grinding be done most thoroughly. Sometimes granulated slag is used. This mortar sets rather slowly, but sets very hard. In a town like Middlesbrough, where building operations are always being extensively carried on, mortar could be supplied at a constant and cheap rate.

Slag wool is still manufactured, and the production of scoria blocks is increasing. The latter are now being shipped from Middlesbrough, and if they were better advertised and the sale pushed a much greater demand would undoubtedly be created, particularly as their value for paving purposes has been so clearly demonstrated in the towns of the Cleveland district.

Blast furnace slag which is sufficiently soluble to become decomposed in the soil has some value as a fertilizer, not only for the lime it contains, but also, probably, for its contents of silica.

But in spite of all these more or less successful attempts at the utilization of slag, we are practically as far off as ever in getting rid of, usefully, this costly and unwieldy waste product. It has been clearly shown that useful materials can be made from it, and the problem before us is to make their manufacture a success commercially, and at the same time to find out some other means of utilization which will use up, if possible, all the slag made.

*The Extraction of Cyanide from the Blast Furnace.*—In Bell's "Principles of the Manufacture of Iron and Steel" analyses of the fume at different levels of an 80-foot furnace are given. At a distance of 26½ feet from the tuyeres the fume contains 89.2 per cent. potassium cyanide. The demand for this substance has of late years increased enormously, owing to its extensive use in the gold fields. Attempts are now being made to extract it from blast furnace fume, by inserting tubes about the boshes, drawing off the fume, condensing and collecting the potassium cyanide. Should this prove successful, it will become a valuable by-product.

*A New Rod Mill.*—The Kokomo Wire & Nail Company of Kokomo, Ind., will place at once the order for the machinery for a rod mill of 250 to 300 tons daily capacity. They will also build another wire mill so as to take the surplus capacity of wire rods, which is not consumed in the present plant. It is expected that the works will be ready for operation by January 1. The new plant will be located at some point on the Ohio or Mississippi rivers, the exact locality to be determined in a few days. The rod mill will supply the rods for both the present plant and for the works to be put in this season, the lines of manufacture being all kinds of wire

nails, fencing, &c. The officers of the company are A. A. Charles, president; Harry Ward, treasurer and general manager, and J. E. Frederick, secretary.

#### Central American Correspondence.

SAN JOSE, C. A., May, 1901.—The steady advance in prices of steel and iron in the United States has caused the holding up of a number of orders in Central America, the general belief here being that this rise in price is only temporary.

Much has been said lately in certain organs of the American press regarding the large holdings of the Germans in these countries. It is true that that nation through its merchants has land and plantations valued at nearly \$100,000,000. But can we blame them for it? This is one of the most prolific and richest sections of the globe; the Germans have merely worked up a trade that our people would not look at. For years American firms have thought Latin American trade "too small" withal, and their imports and exports yearly are worth some \$600,000,000. Still, to-day there is not a first-class important American firm established in all Central Amer-

ica. Naturally, there is still plenty of room for American enterprise, but we must not blame the Germans for keeping right ahead and increasing their business wherever they can. It is true that the Germans are usually slower than we are, and perhaps that is one reason for their ultimate success in Latin America.

The loan which Nicaragua is negotiating is being taken mostly by German firms. It is understood that a principal portion of this loan is to be used in the completion of the railroad to the Atlantic and the one from Managua and Leon to the Honduras frontier.

Much interest has been shown in all these countries in the Pan-American Exposition, to be held at Buffalo, and since the special commissioner of the Exposition was here many of the principal producers of the country have determined to take a hand in the exhibits.

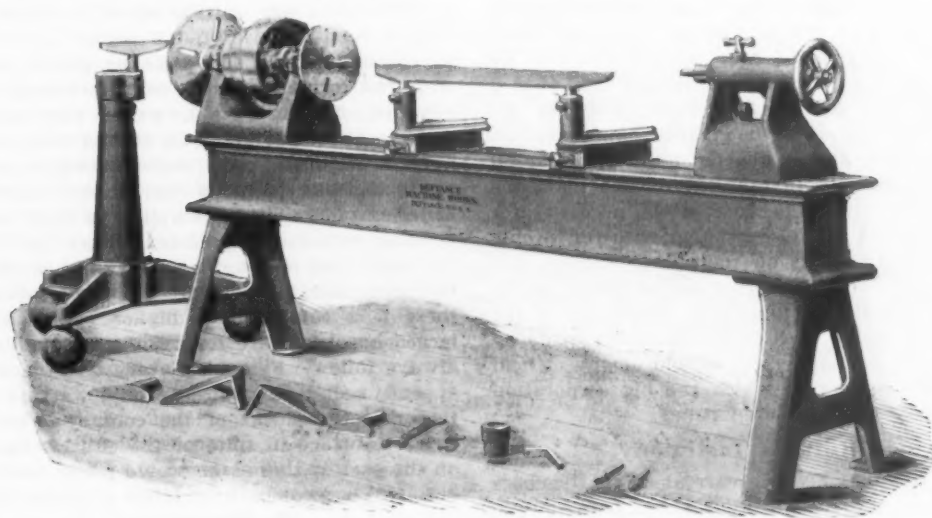
Many Americans in Guatemala are again sending petitions to Washington requesting the removal of Dr. Hunter from his post of United States Minister, the claim being made that he always favors the native Government and never thinks of protecting Americans and their legitimate interests.

The increased yield of the coffee plantations added to higher prices has given a better tone to business throughout Central America, and larger imports may soon be looked forward to.

**The John Wales Wire Company.**—The John Wales Wire Company are capitalized under the laws of the State of Maine for \$200,000, and have purchased the entire plant of the old Corliss Safe Works, Auburn, R. I., consisting of three large brick buildings, especially

#### The Defiance Iron Bed Wood Turning Lathe.

The bed of the lathe here illustrated is 10 feet long, and of the box pattern. The inner shoulders forming the opening in which the tail stock slides are planed square



THE DEFIANCE IRON BED WOOD TURNING LATHE.

and parallel, making a close fit to allow the tail stock to be moved without binding, and maintaining at all times the alignment of the centers. The spindle runs in large split bronze bearings provided with self oiling cups. The pulley has three stops, 8, 10 and 12 inches, for a 3-inch belt. It is balanced to insure steady running. The spindle is furnished with both a screw and plain face plate and the usual centers. A floor stand of sufficient weight to be firm is furnished for the support of the tool. This lathe is built by the Defiance Machine Works of Defiance, Ohio, in two sizes, swinging 20 and 24 inches.

#### The Armstrong Bros. Tool Company's New Plant.

The Armstrong Bros. Tool Company, manufacturers of lathe and planer tools, have removed their office from its late location at Washington and Desplaines streets to their factory at 617 to 621 Austin avenue, Chicago. Their entire business will thus hereafter be conducted under one roof, which will save considerable time in getting out shipments. The company are securing a fine trade on their new gang planer tool recently illustrated in these columns. Orders are being received from abroad as well as from domestic users. One of the best foreign orders just filled called for 14 of these tools, to be shipped to the Brussels branch of Schuchardt & Schutte. A large shipment of tools has just been made to the Puget Sound naval station. While the company do quite a business direct with large consumers, about 75 per cent. goes through the hands of the jobbing trade.



## The Federal Industrial Commission.

WASHINGTON, D. C., May 21, 1901.—The Federal Industrial Commission during the past week has taken the testimony of three prominent men in the iron and steel business who were chosen as witnesses for the reason that the commission regarded them as representatives of the so-called independent interests. They are Hermon B. Butler, vice-president and treasurer of Joseph T. Ryerson & Son, iron and steel dealers, of Chicago; Willis L. King, vice-president of Jones & Laughlin, Limited, iron and steel manufacturers, of Pittsburgh, and E. O. Hopkins, president of the Sloss-Sheffield Steel & Iron Company of Birmingham, Ala.

The text for the interrogatories addressed to these witnesses was found chiefly in the recent testimony of President Schwab of the United States Steel Corporation, the purpose being to develop, first, the extent to which the independent producers agree with Mr. Schwab's views on general economic conditions in the trade, and, second, whether the formation of the big merger has created widespread apprehension as to the future of the small companies. When the names of the witnesses were announced it was semiofficially intimated that it was expected they would criticize the new corporation and in a general way would severely deprecate their formation. This suggestion was not realized in the testimony of the three witnesses examined, and it is a significant fact that all of them were united in the opinion that the formation of the gigantic new consolidation, with their one and a quarter billions of capital would have a distinctly favorable influence upon the smaller companies, chiefly because of the necessity for maintaining prices at a level consistent with fair profits in order to earn dividends on their large capital, but at the same time avoiding unreasonable prices, which would tend to stimulate competition. While all of the witnesses did not agree with every statement made by Mr. Schwab, their testimony was devoid of any critical reference to the manner in which the big corporation were organized or their declared policy.

### Hermon Butler's Testimony.

Mr. Butler said that his firm carried on the business of dealing in iron and steel in the form of bars, sheets, plates, tubes, &c., and might be styled jobbers, although their operations were confined chiefly to supplying consumers rather than retailers. Within the past three years, he said, there had been extreme fluctuations in the price of steel bars, for example, ranging from \$19 to \$45 per ton, but that it was doubtful if during the progress of these fluctuations actual consumption was increased or diminished more than 15 per cent. "It is those who stand between consumer and producer," said the witness, "that are largely responsible for the expansion or contraction in the demand. In speaking of the consumer, I mean the man who finally pays for the finished article, be it household utensil, farm machinery, building material or railroad equipment. It is in his hands that the article begins to wear out, and where new wants are created. By middlemen I mean all manufacturers, from the individual workers in the country villages to the great employer of thousands of men in so many of our industrial enterprises. In a smaller way, but more generally regarded as the middleman, is the dealer, be he country dealer or great merchant or jobber.

### The Middleman.

"Between the consumer there are many middlemen before the producer is reached. Beginning with the blacksmith, who may carry a few kegs of horseshoes, who is supplied by his country storekeeper, who in turn draws on the large city jobber, there are three so-called middlemen, whose stocks never appear in statistics and who are all powerful in fixing prices. In the face of approaching good times each of these anticipates a few months' requirements by free buying. As uncertainty and doubt come, the buying is from hand to mouth, and if continued leads to loss, which eventually falls largely on the manufacturer. Some continue to operate at a loss who have a long enough purse, while other less

favorable competitors suspend operations and await the return of the demand. These fluctuations have offered attractive fields for speculation, and have affected the smallest retail buyer as well as he who operates in millions of tons. It is my contention, therefore, that while statistics may show great differences in the apparent demand as represented by tonnage production in varying years, they do not show what goes to the consumer, but rather the speculative demands, as heretofore shown.

"During these fluctuations the consumer pays just as much for shoeing his horses, or repairing his farm machinery, regardless of the Pittsburgh price of steel billets or any finished form of same. You nor I do not find our household utensils, clothing, food, rent, insurance premiums, bank interest, railroad fares, affected by the varying values of iron and steel. But rather do we know that what we produce or sell shows a larger profit or is in greater demand when iron or steel is high, while at the same time there is little if any material increase in the cost of the necessities of life.

### Trade Agreements.

"Associated with the inevitable fluctuations in prices, trade agreements or combinations have come into existence with every upward wave in values. They have seldom been a cause of, but rather a part of, all such movements. Their end came as prices receded. They were the formal or public announcement of a uniform advance affecting all alike rather than an effort to secure an abnormal profit by stifling competition. These agreements have been made between manufacturers producing like products and dealers handling similar articles in large cities, as well as in small towns. Those entering into these agreements have had in view very moderate and reasonable ideas as to profit, but manufacturers and their buyers and users always scent in these iron combinations higher prices, and their enlarged purchases are responsible for the advances that always follow. Following every trade agreement there appears such a demand as would warrant the supposition that the stocks of the country were exhausted. Prices advance in spite of the effort to prevent a rise on the part of those who would profit most by this condition. Then competition follows, overproduction is apparent, and profits disappear until business is continued at a loss except by those most favored. At this point economies in manufacture never dreamed of before, and new forms of consumption hitherto unknown, are developed until prices again advance, and one by one trade agreements are once more entered into and up and down prices go and ever will go.

### The Influence of Combinations on Wages.

"The influence of combinations on wages has been beneficial, I believe. It is a safe axiom that those concerns who are the most successful pay the largest wages. If combinations are able to induce large profits, the wage earner by this fact must benefit. He can secure better terms from one who is making money than from he who is not, and he has greater opportunities for learning the facts regarding this matter from a large combination than from a small one or an individual.

"If the public press is to be depended upon, organized labor welcomes the new order of business, and we must accept its judgment. It is said that much labor could be done away with which deals with the selling or accounting of various concerns to be operated under one head. This may be true, but at the same time there would be the necessary addition of new or enlarged departments, to deal with cost keeping or statistical records, and carried on to a refinement unknown or unnecessary in smaller or individual concerns. This would make the business a science, and would absorb much of the labor that might seem superfluous to the organization. Nor is it to be supposed that the great 'captains of industry' are to receive less for their added responsibilities than when they were controlling smaller industries.

"I am hardly prepared to speak as a prophet with reference to the beneficial or injurious effect of the 'combinations.' It will be the fellow whose toe is



stepped on that will make more noise than the thousands who are quietly and happily pursuing their course. With every development of human life some must suffer. Steam was the death of the stage coach and petroleum of the tallow dip. If the new conditions are best for the greatest number, they will survive, and no man, much less your witness, can guess better than this."

#### Consolidations and Competition.

Replying to questions by Professor Jenks, Mr. Butler said that one of the effects of the big combinations in the iron and steel trade was to stimulate competition. They were organized, he said, to make money, and being heavily capitalized, the profits which they must earn would prevent a very material reduction in prices, and hence other concerns would be induced to enter the same business. He thought the consolidations had in no sense stifled competition, and, in fact, had made no effort in that direction. Ample supplies had been available during the past two or three years for any one who desired to purchase either from the consolidations or from independent manufacturers. Fair profits were necessary in the business, especially because constant improvements were required to keep up with the development of the industry, as any plant five years old was apt to be antiquated as compared with one newly equipped.

Replying to a question as to whether an independent tin plate company could be established in the United States on a reasonable amount of capital, Mr. Butler said he believed it had recently been done at Sharon, Pa., with a capital of about \$9,000,000. He understood that President Schwab of the United States Steel Corporation had recently visited the plant and pronounced it to be very well equipped. Large concerns, he said, might possibly be able to freeze out small competitors, but only at a sacrifice that was suicidal. As a general rule, he said, combinations were of advantage to small concerns. The big corporations must operate under a species of public programme, the details of which all their competitors could easily ascertain, while the small manufacturer could operate under cover, produce lines of specialties, and secure larger profits. Of course the small manufacturer could not compete so satisfactorily in the production of staple articles. The witness quoted Mr. Bartlett of Chicago, who, he said, was one of the largest hardware dealers in the United States, in confirmation of this opinion.

#### The Export Trade.

As to the export trade in iron and steel, the witness said he had done some export business, and had usually sought lower prices for the material purchased for this purpose, but had not always secured them. It was natural, he said, to expect lower prices for foreign business, and the same principle was true as to business at remote points in the United States, a merchant usually being willing to take a lower price to get into a market far distant from his headquarters.

In reply to a direct question as to whether a tariff was necessary to the iron and steel industry, the witness said:

"When we can produce, as we can at the present time, lower than any other people, we no longer need it. If I were a manufacturer I would say retain the tariff, but as a tax payer, I believe it should come off."

Referring again to the export business, Mr. Butler said that his firm had supplied considerable material to South Africa in competition with English manufacturers. He secured the business for two reasons: 1. Because raw material was cheaper, but especially because the shop work required on the material, which his firm sublet, was much more cheaply done in this country than in England, where labor unions, with their arbitrary rules, made it very easy for foreigners to compete. As to whether the new consolidation would attempt to dispense with jobbers and all other middlemen, the witness said he hardly thought so, but that the question was one which was not keeping him awake at night. The jobber, he said, was the fly wheel of commerce, maintaining the equilibrium between the manufacturer and

the consumer. He could be relied upon to take a certain amount of product when the demand was light, and so was of assistance to the manufacturer, and on the other hand he was able to supply the consumer from his stocks when the manufacturer could not do so. In distributing and taking care of credits he was extremely useful.

With regard to current prices, the witness said in his opinion they could not be criticised, especially in view of the fact that the present demand was unprecedented. He thought the general tendency would be toward lower prices. When asked whether he thought the capitalization of the big combinations was warranted and whether he would limit it to tangible assets, he said he thought no capitalization should exceed what might be styled "tangible and assured assets," and that "prospective" assets should not be counted in. The capitalization of good will at high rates served to stimulate competition, as new concerns were not burdened with assets of that character.

Replying to a question as to whether in his opinion Congress should pass any laws restricting combinations, the witness replied:

"No. Any such law would be in the direction of the restraint of trade and could only do harm."

#### The Testimony of Willis L. King.

Willis L. King, vice-president of Jones & Laughlins, Limited, was the next witness. He stated that his firm were large manufacturers of bar steel, structural steel, rivets, chain, cold rolled shafting and fittings, spikes, railroad specialties, &c. The capacity of the concern at the present time was sufficient to handle about 750,000 tons of pig iron or about 600,000 tons of finished products, valued at about \$20,000,000. The firm had been in existence 50 years, and were operated under the limited partnership laws of Pennsylvania, which were similar to the corporation laws of other States. The firm were recapitalized about a year ago at \$20,000,000. When the limited partnership was first formed, about 20 years ago, the capital was fixed at \$5,000,000. In reply to questions by Professor Jenks Mr. King said:

#### The Ore Supply.

"Our supply of ores comes from the Lake Superior region, where we own certain mines. We control an output of from 1,250,000 to 1,500,000 tons of ore per annum, and we believe that our properties represent at least a 30 years' supply. At the present time we sell no ore and mine only what we need, but until recently we purchased some ore in the open market, a necessity to which we are no longer subject owing to the recent acquisition of ore properties. We use no imported ores, though I believe some steel manufacturers on the Atlantic Coast employ them. The present tariff on ore is not sufficient in my opinion to affect the use of imported ore. We import no scrap steel, and although we were buyers of scrap some time ago, we now supply our own needs. So far as the tariff is concerned, it would make little difference in our district should it be removed from scrap steel, on account of the freight."

Would not the removal of the tariff on ore and scrap steel be of great assistance to manufacturers having plants on the Atlantic Coast? was asked.

"I do not think it would make any great difference and it certainly would not enable Eastern manufacturers to get into Western markets. Further, I do not think it would in any way affect the price of Lake Superior ores."

"Are Lake Superior ores controlled by any one organization to such an extent as to enable that organization to fix their price?"

"The organization you refer to would have a good deal to do with fixing the price. The recent reduction of \$1.25 is regarded in the trade as having been brought about by the influence of this corporation."

Replying to a question by Commissioner Kennedy as to the proper figure at which unmined ore should be capitalized, the witness said that there were so many contingencies to be considered that it would be difficult to fix a price. Commissioner Clark suggested that in view of the "known limit of supply" the price should

be comparatively high, but the witness would not subscribe to this proposition, saying:

"I am not among those who believe that the present visible supply of iron ore is all that we shall find. I think as demand increases and the present supply becomes exhausted, other discoveries will be made, possibly in the United States and possibly in Canada. Our experience in the discovery of oil and natural gas will, I think, be repeated as to iron ore and coal. The scarcer a product becomes the more capital will be put into finding and developing new deposits."

"Do you take issue with President Schwab's statement as to the high value which should be placed upon ores for the purpose of capitalization?"

"I should not like to be understood as criticising any statement of President Schwab's, but as a matter of my personal opinion I do not think ores should be put in at more than their present value. I think it is likely that they will be cheaper rather than dearer in the future."

As to whether foreign ores were necessary for fluxing purposes, the witness said that in his opinion there was a sufficient variety to be had in the United States. The researches of the United States Geological Survey had been very accurate in the matter of outlining the limits of the Lake Superior iron ore deposits, as had been proven by private experts, but the amount of the ore within those limits had been but vaguely estimated. Until recently no attempt had been made to mine ore below the so-called green stone formation, but some had been found below that stratum, and there might be a great deal more there, although that was still an open question. There was no reason to doubt that the Lake Superior region would be able to supply the trade for 80 or 100 years. Up to the present time no deposits of any consequence had been found in Canada, but the experts were still investigating that field. In reply to a question by Commissioner Farquhar as to the best opinion ten years ago concerning the ores in sight, the witness said that the Mesaba field had been discovered since that time, making it necessary to revise opinions very radically.

Returning to the operations of his own company, the witness said that the bulk of their ores were shipped on yearly contracts with the carriers, although the company had an interest in a few vessels. As to whether there were many vessels not controlled by the United States Steel Corporation, the witness said there were quite a number—sufficient to enable independent firms to get their ore without trouble. As to the supplies of coke, he said his firm owned coal lands on the Upper Monongahela River very well suited to the making of good quality coke. These coals were not strictly Connellsville, but they were of excellent quality, and the supply in sight was sufficient for 35 or 40 years.

#### Prices and Pooling.

Taking up the question of prices during the past four or five years, Mr. King said that the fluctuations had been very great, so great, in fact, that it was practically necessary to strike an average of the past eight or ten years to show the real profits of the steel business.

"Have there been pools among the steel manufacturers as to prices and limit of output?" asked Professor Jenks.

"There has always been more or less consultation among manufacturers," replied the witness, "but very little pooling. The market usually regulates all pools. There have been what the technical papers have called 'gentlemen's agreements,' designed to maintain a fair level of prices and permit profits to be made. There has been no division of territory so far as my knowledge goes. I understand there has been some effort to restrict the total output of steel rails, but I have no personal knowledge of it, for we make no rails. These agreements do not last long, for if the price goes down they will not stand, in spite of the best efforts of their promoters. So far as I know, no forfeits have ever been levied for failure to keep the agreements."

Referring to the general condition of the structural steel market in the past year or two, the witness said

that, generally speaking, the movement of prices had been conservative in that they had not gone as high as the price of competitive material. He added that there were only about half a dozen manufacturers in the country producing full lines of structural steel, although there were other companies making certain classes. As to the dearth of structural steel about a year ago, it was due to the fact that stocks were depleted and the consumption for a considerable period was much greater than the available supply. Unquestionably, manufacturers had increased their prices because of the demand, but not to such degree as prices in other lines had been augmented.

#### The Export Trade.

When questioned by Professor Jenks as to the export business of his firm and the relation borne by export prices to domestic prices, Mr. King said: "We are not exporters to any great extent, though we send abroad some of our specialties like cold rolled shafting. Our prices for foreign shipment are somewhat lower than for domestic consumption, but not from choice. No manufacturer can run to the best advantage unless he runs full, and it is much better to do so and sell the surplus abroad, for it has the effect of cheapening the cost of the whole output, which reduces price to the domestic consumer. We export so little that it is not an important factor in our business. Once in a while when we have a surplus we take an order. The difference in price is usually not more than \$1 or \$2 a ton, and although we have to meet the foreign price we usually find that it is the freight that makes the chief difference. Ocean freights to England from the Atlantic seaboard range from one and a half to two times the cost of the railroad freight from Pittsburgh to the seaboard."

#### Freight Tariffs.

When asked whether his firm published any freight tariffs Mr. King replied in the negative, adding that they depended exclusively on the railroad tariffs. Some of the big combinations, he said, had gotten out tariffs, but they were only based upon schedules published by the railroads.

"Is it not a fact," asked Professor Jenks, "that manufacturers base their freight charges on shipments from a single point, whether the goods start from that point or not?"

"They must do so," replied the witness, "to put all consumers on a level."

Professor Jenks then took up the subject of labor and asked the witness whether his firm employed union or non-union men.

"Our mill," replied Mr. King, "would probably be called non-union. We stopped treating with the unions about three years ago."

"Were wages reduced during the last period of depression in the steel business?"

"Yes, and they were advanced when better times came. I cannot give you the detailed figures."

#### Economies Through Consolidation.

Referring to the combinations in the steel trade, Professor Jenks asked whether, in the opinion of the witness, important economies could be secured by consolidations, to which Mr. King replied that very considerable savings could be made by avoiding cross freights, in shipping to the customer from the nearest mill, and in dispensing with superintendents and many high priced officials.

"Do you find your own business handicapped because your plant is concentrated at but one point?"

"Not as yet. Of course the United States Steel Corporation are so new we cannot tell much about the future."

"Do you find a market for your entire output east of Chicago?"

"No. We probably ship one-third of our output west of Chicago, or, to put it another way, we probably market three-fourths of our product west of Pittsburgh and one-fourth east of that point. Our chief competitors are located in Chicago and Milwaukee."

"Have you any advantage by reason of the fact that



your business is directly managed by its owners rather than by salaried officials?"

"Yes, I think we have some advantage. There are always some compensating advantages, I am glad to say."

Comparing wages now paid with rates current in 1891 and 1892, the witness said he thought they were considerably higher at the present time, taking an average of all the employees.

"Every mill is different in its equipment, however, as to tonnage and machinery, and it is difficult to compare them. In former times a few skilled men got very high wages, while the rank and file made very moderate earnings. Now there is a much better and more equitable distribution. Under the Amalgamated scale in the old days some few men were paid \$30 or \$40 a day. They hired their own crews, but they made a very large net wage without doing much hard work. It would not be fair to say they did not work at all, for the quality of the output depended upon their skill."

"Why did your firm refuse to sign the Amalgamated scale?"

"Because we had a disagreement on the subject of wages."

"The disagreement did not relate to the management of your establishment?"

"No."

"Does a great combination like the United States Steel Corporation weaken or strengthen the position of a smaller and independent manufacturing establishment like yours?"

#### Competition Against Consolidation.

"Any concern to compete with the United States Steel Corporation must be in position to do so by owning their raw materials and having a mill well situated and equipped with modern machinery. I would say it would have a bad effect on the small manufacturer who did not own his raw material; but I presume it will be more so in the future than it has been in the past; it will be a question of the survival of the fittest. Of course, if you make a large tonnage you are much better off than if you make less in competing with a big concern."

"If a mill has capital sufficient to enable it to reach the maximum of efficiency, of what use is additional capital?"

"A mill to be economically run must have its own supplies of raw material. I think that a mill owning its supplies of ore and coal and capable of producing 2000 to 2500 tons a day, with proper management, could reach the maximum of efficiency, and there would be no gain in efficiency by doubling the output."

"What would be the approximate cost of such a plant?"

"From \$20,000,000 to \$30,000,000. While I would state it as a general proposition that independent operators could not expect to live as against the United States Steel Corporation if they were not fortified by abundant capital, owning their raw material, possessing furnaces of the most modern type and thoroughly equipped, there is quite a respectable minority of these people in existence to-day, and I do not feel that there is any cause for alarm."

"Has competition been seriously interfered with by this combination?" asked Chairman Kyle.

"No, the minority is too large, but I think that in the future capitalists will be disposed to put their money into existing independent companies instead of starting new concerns."

#### Prices.

With regard to the probable range of prices in the future, the witness said he thought the average of the next ten years would probably not be higher than during the last ten years. He thought the conditions brought about by the organization of the United States Steel Corporation would have a steadying effect on prices and would prevent "these extraordinary and harmful rises and depressions in the market."

"As an independent manufacturer," asked Commissioner Farquhar, "do you not feel that you can 'stay' at the market rate, whatever it may be?"

"Yes, because of our facilities."

"If prices should be cut by the United States Steel Corporation, would not their losses be greater than yours in proportion to the difference between their capital and yours?"

"I think so."

"If \$20,000,000 worth of capital were available, could a company be formed to-day to do a profitable business in the manufacture of steel?" asked Commissioner Litchman.

"Yes, if they could secure supplies of raw material. They could probably do so, but that would be the first and most important point for them to consider."

"Do you consider the possession of the Connellsville coal fields, owned by the United States Steel Corporation, a big advantage?"

"Yes, to a plant located in Pittsburgh; but in other fields there are coals that are even purer; for example, I consider Pocahontas the best coal in the world."

"Returning to the question of cutting prices," said Commissioner Kennedy, "would not the United States Steel Corporation suffer much more relatively than an independent concern, because of the amount of water in their capital?"

"As a general proposition, that is correct."

Replying to an inquiry by Commissioner Clarke as to whether steel making could be profitably carried on in New England, if the duties on iron ore, scrap iron and steel and bituminous coal from the Nova Scotia coal fields were repealed, Mr. King said that it might be possible if the United States Government would follow the example of Canada in granting a bounty of \$2 per ton on the output, but not otherwise.

"You might make open hearth steel," continued the witness, "but you have no Bessemer ores, and the Nova Scotia coal is too high in phosphorus and sulphur to make good Bessemer steel."

#### The Tariff.

"If the duties on iron and steel at the present time have very little influence on the trade, why could they not safely be repealed?" asked Commissioner Clarke.

"I do not believe the import duties should be repealed or reduced. They may be a dead letter now, but the time may come when they will be necessary for the protection of American manufacturers and labor."

"It would not hurt you to have the tariff taken off when you ship three-fourths of your product west of Pittsburgh."

"Please do not forget that one-fourth of it goes East. We would think we were very badly off if we were shut out of one-fourth of our market."

"Some of the people along our sea coast," commented Commissioner Clarke, "feel that they should be exempted from tariff burdens of any kind."

"I think," rejoined Mr. King, "that the tariff should be operated on the basis of the greatest good for the greatest number. The New England manufacturer who sells a machine gets a price for it that covers the tariff on his material."

"As a general proposition, do you think that present conditions warrant any reduction in the tariff?"

"In my opinion it is better to let the tariff alone. The interests of the whole country would be injured by any general tariff agitation at this time."

#### The Testimony of F. O. Hopkins.

The last witness examined by the commission concerning the iron and steel industry was F. O. Hopkins, president of the Sloss-Sheffield Steel & Iron Company of Birmingham, Ala. Mr. Hopkins said that the present condition and development of both material and iron in the Birmingham district could best be shown by a comparison of the output in the State for the past five years, which he gave, as follows:

Coal.—1896, 5,747,698 tons; 1897, 5,893,771; 1898, 6,416,741; 1899, 7,484,773; 1900, 8,504,327.

Coke.—1896, 1,689,307 tons; 1897, 1,395,352; 1898, 1,609,839; 1899, 1,798,612; 1900, 1,992,561.

Pig Iron.—1896, 922,170 tons; 1897, 923,895; 1898, 1,206,559; 1899, 1,083,905; 1900, 1,155,583.



These figures, the witness said, showed a gradual and healthy increase, more marked in coal than in coke and pig iron.

Concerning the relations of the industry to labor, he said the situation had been very satisfactory, especially since 1894; there had been an increase in wages and no labor troubles of serious nature. The only workers affected by a uniform sliding scale in the employ of the Sloss-Sheffield Company were the coal miners, whose wages during the past five years had steadily risen from about 38 cents per ton for cutting coal to 55 cents, the price now paid. Every 2½ cents advance to the miner carried an advance to drivers, men driving entries, and coke men, all of whom have been advanced about 33 per cent.

#### The Influence of Consolidations.

Concerning the influence and effect upon independent producers in the South of the big consolidations, Mr. Hopkins said:

"The apparent influence of the larger combinations upon the industry is beneficial. How long this will last is problematical. Considering the obligations to be met by the large combinations, their endeavor will be more than ever to maintain prices. However, as everything at last comes down to a question of supply and demand, the final effect cannot yet be determined. Thus far it has been beneficial."

Replying to a request for some data as to the formation of the Sloss-Sheffield Company and their present resources, the witness said:

#### Southern Iron Manufacture.

"The Sloss-Sheffield Company were organized to acquire the Sloss Company and several other separate properties, and the advantages thus far developed are important. We have not as yet developed any disadvantages. The advantages derived are due to a considerable extent to the ability of one management to handle at a reduced expense a larger output. The advantage to the district is even more marked, as properties for years idle are now practically rebuilt and again placed in operation. This is especially the case as to furnaces, the capacity of the company for pig iron production having been doubled by the acquisition of additional furnaces at Sheffield and Florence. This rebuilding of furnaces, reopening of ore mines and quarries, with the construction of coke ovens, purchase of additional property, &c., has entailed an outlay of more than \$1,000,000. As to our natural resources, we have practically an inexhaustible amount of coal, ore and limestone all within a radius of 25 miles of our Birmingham furnaces, and the same as to brown ore and limestone at the Sheffield-Florence furnaces. These materials are all eminently fitted for the manufacture of pig iron, either for foundry or for basic steel. All of the coals are bituminous, or semibituminous, the latter being used strictly for steam and domestic purposes, the former for steam and coking.

"Our ores consist of hard red ore, soft red ore and brown ore. A general average of the hard red ore shows metallic iron, 38 per cent.; silica, 13.50 per cent., and carbonate of lime, 26.20 per cent. The soft red ores are as a general thing the outcroppings of the ores which under heavy cover become hard. These ores vary greatly, some which we work being as low as 25 per cent. in metallic iron, while others run to 50 or 54 per cent. The brown ores or limonites properly washed show about 50 per cent. metallic iron, 10 per cent. silica, 0.5 per cent. phosphorus.

"Our coal fields include the Warrior, Cahaba and Coosa. The Warrior contains over 7500 square miles, with an estimated tonnage of 37,000,000,000 tons. The Cahaba, of 400 square miles, has an estimated tonnage of 4,000,000,000 tons, and the Coosa, of 345 square miles, an estimated tonnage of 600,000,000 tons. These will permit of a larger output than the present for 1000 years."

The witness here submitted the following average analyses of the coals referred to:

Warrior.—Moisture, 1.02 per cent.; volatile matter, 31.85; fixed carbon, 63.82; ash, 3.31; sulphur, 0.70.

Cahaba.—Moisture, 1.68 per cent.; volatile matter, 34.13; fixed carbon, 60.16; ash, 4.03; sulphur, 0.56.

Coosa.—Moisture, 1.43 per cent.; volatile matter, 32.21; fixed carbon, 60.85; ash, 4.41; sulphur, 1.10.

The average analysis of coke was given as: Volatile matter, 0.90 per cent.; fixed carbon, 87.50; ash, 11.60; sulphur, 0.50 to 1.60 per cent.

Replying to questions by Professor Jenks, the witness said that in his opinion the output of pig iron by his company during the present year would amount to about 1,200,000 tons. The company had been able to sell their iron for \$11 per ton, which enabled them to pay 55 cents for coal cutting, which was the highest wages paid by any company in the State. While the company were in no sense a trust, they had been able to effect some economies through the acquisition of additional furnaces which permitted them to employ high class men at the head of each of their departments.

The authorized capital of the company was \$20,000,000, one-half preferred and one-half common, but the issue up to the present time was only \$6,700,000 preferred and \$7,500,000 common, and the company would not probably issue any more stock. They own 64,000 acres of coal and 48,000 acres of ore lands. Their limestone was near at hand, and the question of raw materials was eliminated from all problems as to future competition. Birmingham pig iron, the witness said, made good steel. A coking coal had been found in the Pratt seam in which the sulphur showed as low as 0.45 per cent., so that where Virginia coke was formerly used the home product was now employed. The Tennessee Coal & Iron Company, he said, would be rolling steel rails from Southern pig iron within the next 90 days.

As to competition, Mr. Hopkins said his company were not only forced to meet ten other Southern companies, but competed to some extent with manufacturers in the Pittsburgh district when the price would permit the payment of freights. Conditions varied constantly, for iron was a curious commodity in that it was constantly going up or down, never remaining stationary for any length of time.

Commissioner Kennedy asked the witness if the United States Steel Corporation were making an effort to secure iron and coal fields in Alabama, to which the witness replied that he would very much like to know, but that, of course, no one would know anything about it in advance of the consummation of such a deal. As to whether there was a market for Southern made steel in the South, Mr. Hopkins said it was constantly increasing. Considerable quantities were needed for making of cotton ties, and the Richmond Locomotive Works had used a good deal and found the steel made therefrom to be the best they had ever handled. The Tennessee Coal & Iron Company were now making into steel about 700 tons of their 2000 tons of daily production, and the establishment of a few more industries in the South would easily absorb the present production of Southern iron.

As to exports, the witness said his company had shipped as much as 45,000 tons per annum, but were not exporting any at the present time. He would take a lower price for a foreign shipment, but would not sell at a loss. When asked whether a consolidation of the Tennessee Coal & Iron Company and the Sloss-Sheffield Company, with or without the addition of other companies, would be of advantage to the South, the witness said that would depend upon the policy pursued by the officers of the consolidation. If they put in labor saving machinery and developed properties, the country would be correspondingly helped, but if they closed down the plants it would be a misfortune.

Professor Jenks at this juncture took up President Schwab's statement with regard to the value of unmined ore for capitalization purposes, and asked the witness at what figure it was held in the Alabama district, to which he replied that on a royalty basis it was rated from 10 to 25 cents per ton, but much depended upon conditions. As to Mr. Schwab's high valuation on Lake Superior ores, he said that he would not under-

take to controvert the statement for the reason that the Lake Superior ores were the only ones ever found in the United States running 65 per cent. metallic iron. If it was true, as Mr. Schwab said, and as he heard others say, that there was a limit to the amount of the deposits, they would be very valuable and would become more so in proportion to the quantity taken from them annually.

When asked whether the Sloss-Sheffield Company could be injured by competition in their own field, Mr. Hopkins said that he could not see how they could suffer, unless a very large corporation, with methods like the Standard Oil Company for cheapening production, and with large holdings of ore and coal lands, undertook to produce iron at lower cost. He was not disposed to feel any anxiety concerning the present situation.

In reply to a direct question as to whether he thought the present conditions warranted a reduction in the tariff duties on iron and steel products, Mr. Hopkins said:

"I deprecate seriously any discussion of the tariff question at this time. If one subject is taken up another will necessarily follow, and whether it is in iron or steel or in textiles, I am opposed to any agitation." W. L. C.

### The Proposed Plow Makers' Consolidation.

Upon the authority of a leading manufacturer prominently connected with the organization of the proposed plow combination, says the *Farm Implement News* of Chicago, the following list is presented as embracing the concerns which have given options to the promoters of the consolidation. In all cases except that of the Moline Plow Company, the options have been given direct. The Moline option is in the hands of a third party:

Deere & Co., Moline, Ill.  
Deere & Mansur Company, Moline, Ill.  
Moline Plow Company, Moline, Ill.  
Grand Detour Plow Company, Dixon, Ill.  
Rock Island Plow Company, Rock Island, Ill.  
Morrison Mfg. Company, Fort Madison, Iowa.  
David Bradley Mfg. Company, Bradley, Ill.  
B. F. Avery & Sons, Louisville, Ky.  
Bucher & Gibbs Plow Company, Canton, Ohio.  
Syracuse Chilled Plow Company, Syracuse, N. Y.  
South Bend Chilled Plow Company, South Bend, Ind.  
Fuller & Johnson Mfg. Company, Madison, Wis.  
Kingman Plow Company, Peoria, Ill.  
Pekin Plow Company, Pekin, Ill.  
Peru Plow & Wheel Company, Peru, Ill.  
Sattley Mfg. Company, Springfield, Ill.  
J. Thompson & Sons Mfg. Company, Beloit, Wis.  
Minneapolis Plow Works, Minneapolis, Minn.  
Union Malleable Iron Company, Moline, Ill.  
Bettendorf Metal Wheel Company, Davenport, Iowa.

The options, with the exception noted, were placed in the hands of the United States Mortgage & Trust Company of New York, last week and the fate of the project is now in their hands. Upon the decision of this company, which is expected ere June 1, rests the question of whether or not the plans which were started two years ago shall be successfully perfected.

The options of several other large companies are earnestly desired by the United States Mortgage & Trust Company, and efforts are being made to obtain them. The fact that some of the leading concerns have not consented to become parties to the consolidation on the proposed terms raises the only question as to the outcome of the project. It is possible that some of the desired additional options have been secured since the New York conference. If, however, it is impossible to interest the companies referred to the holders of the options may declare the deal off. On this point they were non-committal, preferring to reserve their decision until later. The options expire June 1. Three of the prominent manufacturers included in the foregoing list express the opinion that the consolidation will be effected regardless of the attitude of the concerns whose options are wanted but not forthcoming.

The Collins Plow Company of Quincy, Ill., and the Eagle Mfg. Company of Kansas City, Mo., have, ac-

cording to one closely identified with the movement, applied for admission to the combination, but the applications have not yet been passed upon.

The plan of organization agreed upon, and which will be followed out in the event of a favorable decision from the financial end of the deal, is as follows:

The appraisements will be made under direction of an audit company by committees of three, one to be chosen by the United States Mortgage & Trust Company, a second by the company interested, these two to choose the third.

The total capitalization will be about \$70,000,000. The exact amount cannot be determined until the appraisements are completed.

One-half of the capital stock will be preferred, the other common.

To the stockholders of each participating company will be issued 7 per cent. non-cumulative preferred stock to the full value of their holdings as determined by the appraisements. They will also receive 80 per cent. of the value in common stock, the remaining 20 per cent. to be reserved for equalizing values should later developments disclose inequalities.

The financial backers will contribute a working cash capital of \$5,000,000, receiving therefor 7 per cent. non-cumulative preferred stock for \$5,000,000 and common stock to the same amount.

For the present the business of each concern will continue without change, the same as in the case of the United States Steel Company. In the course of time it is expected that some of the plants will be run exclusively upon specialties and some may be closed, although it is not the present intention to close any of them. Some of the lines of goods (not classes) may eventually be dropped out entirely. These points will be determined by the trade conditions as they develop.

All of the branch houses of the companies in the consolidation will be included in the sale. In time the distributing agencies will be narrowed down to as few houses in each important center as can conveniently handle the business. Those which are now the least successful will be closed, and the business taken over by the stronger ones. It is improbable that the business in some of the largest centers will ever be concentrated in one house or under one management, but this point is one that will be determined later. New distributing houses will be established at points where there are none at the present time.

Chicago will undoubtedly be chosen as headquarters of the company, if perfected. This feature has been discussed, and Chicago is favored by the majority. Three names have been discussed also, the American Plow Company, the United States Plow Company and the American Plow & Implement Company. The first named is favored.

### The Influence of Copper on Steel Rails and Plates.

J. E. Stead and John Evans have communicated to the Iron and Steel Institute a paper embodying the records of experiments to determine the influence of copper on steel rails and plates. Their conclusions are:

The results confirm most fully, as far as they go, the conclusions of A. L. Colby and W. Lipin. They show that copper has no more right to have the character of making steel redshort than carbon. They prove:

1. That between 0.5 and 1.3 per cent. copper has no deleterious effect on either the hot or cold property of steel.

2. That a very large amount (2 per cent.) makes the steel more liable to be overheated.

3. In small quantities it slightly raises the tenacity and the elastic limit, but, unlike phosphorus, does not sensibly make the steel liable to fracture under sudden shock. Like carbon, it reduces the power of the steel to extend under stress, but this is not pronounced when the quantity is small. The effect is more marked when large quantities are present.

4. That if the evidence of the open hearth steel trial

can be confirmed, copper, instead of producing redshortness, has the contrary effect of changing redshort steel into steel which will roll without cracking.

### The Hughes Process for Manufacturing Steel Billets.

William B. Hughes of Wissahickon, Philadelphia, who has long been connected with the Pencoyd Iron Works, has received patents covering a proposed method for making steel billets, which is applicable more particularly to such plants as with a limited consumption cannot afford the large capital outlay for a blooming mill and yet desire to be independent of the open market for steel billets.

Mr. Hughes' plan is to cast a slab ingot and to slice from it with the aid of a press and shear a series of billet blanks, compressing the steel simultaneously.

of the ingot into close contact with the face of the block B. Power cylinders, O, Fig. 3, put pressure on the ingot through the intermediary of the rock shaft and its arms, N, so as to prevent overturning of the ingot when it has

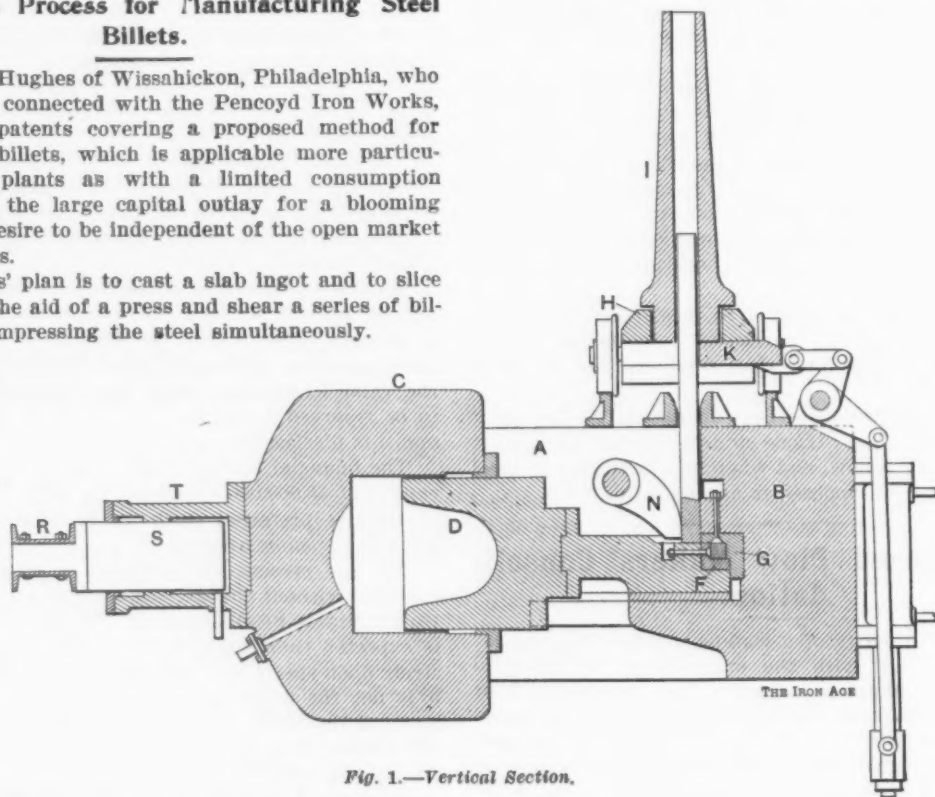


Fig. 1.—Vertical Section.

The machine, which is illustrated in the accompanying engravings, consists of a substantial frame work, A, having at one end a heavy thrust blow, B, and at the other a cylinder, C, with plunger, D, with a head with a reverse right angled die block, F. The dies, when the plunger D is actuated by hydraulic or other pressure, in-

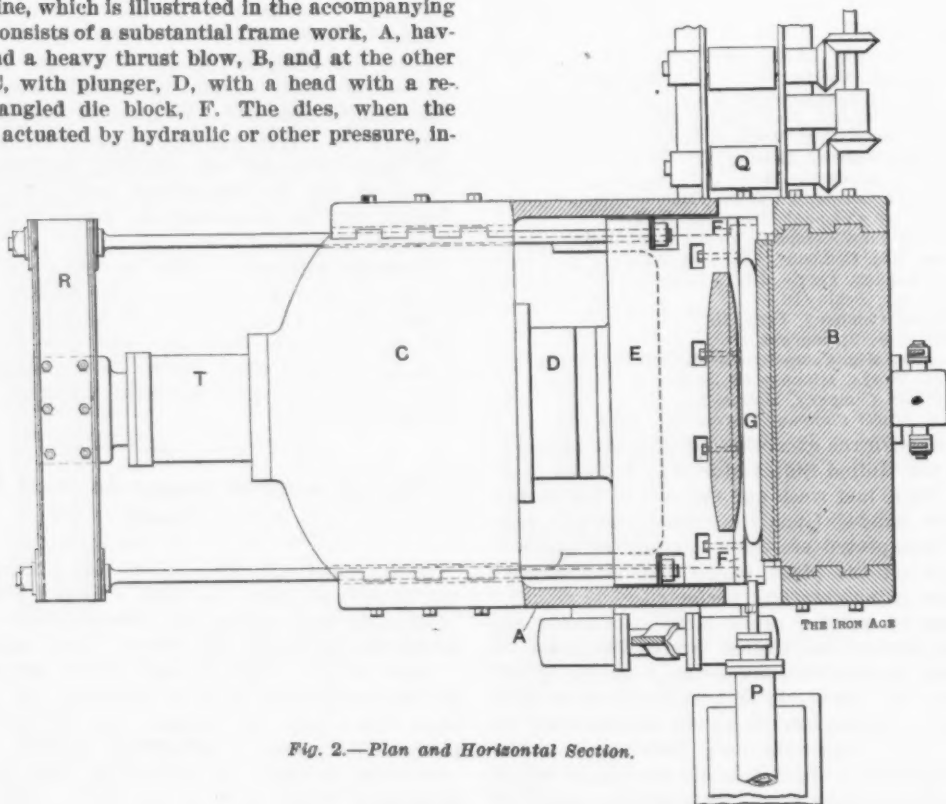


Fig. 2.—Plan and Horizontal Section.

#### THE HUGHES BILLET MACHINE.

close a space of the cross sectional dimensions of the desired billet.

The ingot mold I, Figs. 1 and 3, is carried on a car, which has suitable ways for the guidance of a slide block, K, Fig. 1, whereby the bottom of the ingot mold may be closed or opened. The operation of this part of the mechanism is clearly shown in the drawings. The arms N on a rock shaft serve to press the lower portion

been reduced in length. The power cylinder P, Fig. 3, is used to push the forward billets on the roller table with its rollers, Q.

The head of the plunger D is connected by rods with the cross head R, Figs. 1 and 2, to the plunger S, Fig. 1, of a supplementary power cylinder, S, the function of which is to withdraw the main plunger D when pressure is received from the cylinder C.



The operation of the machine is as follows: The ingot is allowed to descend from the mold, duly guided and held in position by the arms N. The plunger D moves forward so that the die block F shears off the lower end of the ingot and presses the part so cut off forward against the die, thus compressing the plastic mass and giving to it the form desired for the finished billet. The power cylinder P, Fig. 2, then thrusts the billet onto the conveyor. By a repetition of this operation the ingot is entirely consumed.

Mr. Hughes prefers to have the ingot mold larger at the center than at the ends, so as to secure the section shown in Fig. 3 and obtain a more solid billet.

Considering, for instance, a machine for 4 x 4 inch billet as a standard merchantable size, Mr. Hughes would propose to cast a 6000-pound ingot slab, in order to keep down the cost of labor and reduce the number of molds.

This slab will be about 72 x 4½ x 72 inches in size, and will give 18 cuts of 6 feet each, compressing same into billet form. While the billet is thus formed, or immediately afterward, the billet may be cut into four 18-

\$30,000, as compared with about \$250,000 for a blooming mill to roll 4 x 4 inch billets with its equipment of pit furnaces, boilers, engines, cranes and buildings.

#### Pacific Coast News.

SAN FRANCISCO, CAL., May 13, 1901.—A series of strikes has just been inaugurated, of which no one can tell the issue. It started with the strike of cooks and waiters and now threatens to involve sympathetically every trade in the city to the extent perhaps of 40,000 workers, including a great multitude who have more or less connection with the iron trade or interfere more or less with the iron, steel and hardware business. The building trades of the city, most of them, have hitherto stood out against the federated trades, but how long they will be able to withstand the pressure remains to be seen. Of course this has upset business men generally and produced more or less disorder in business circles. The employers of the city, including the greater part of those engaged in the wholesale trade, are banded to-

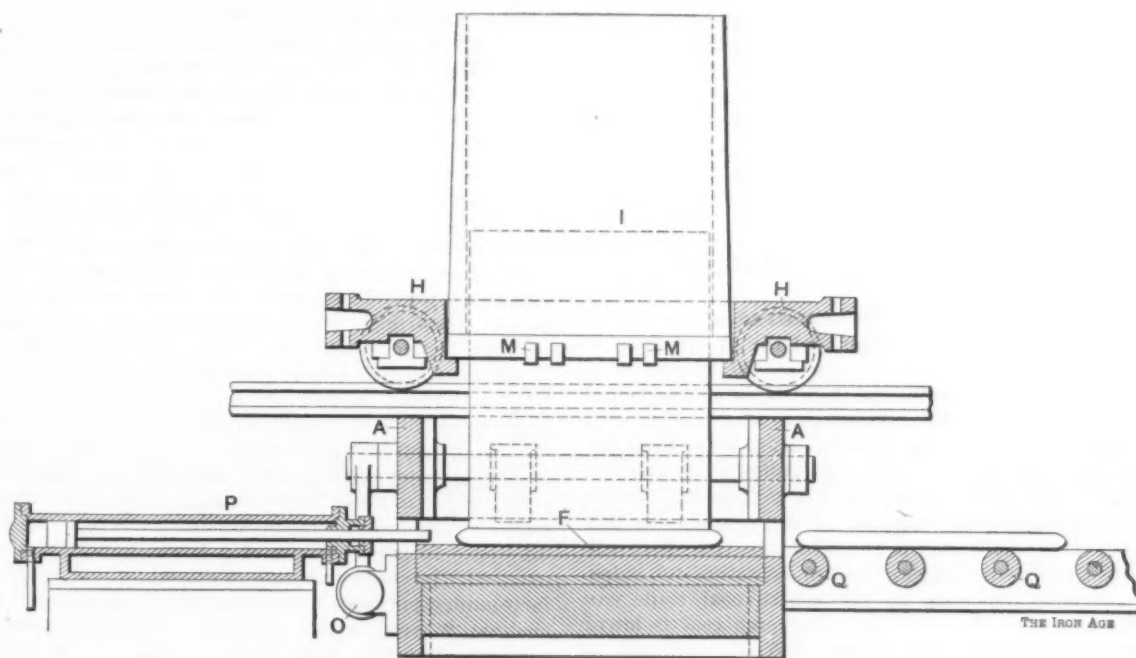


Fig. 3.—Cross Section.

#### THE HUGHES BILLET MACHINE.

inch, three 2-foot or two 3-foot lengths, having weights of about 81, 108 and 162 pounds. It will thus be evident that a variety of billets can be made from an ingot slab of the above dimensions. Heavier billets of shorter lengths can be made in the same machine—namely, a 6 x 6 inch by 5 feet long, weighing about 620 pounds, depending upon fluidity.

To do this work Mr. Hughes considers pressure of 4,200,000 pounds and a cylinder of 34 inches in diameter with a maximum water pressure of 5000 pounds per square inch, giving a pressure on the metal of 10,000 to 15,000 pounds per square inch. These dimensions may seem large, but it will be remembered that the stroke will be small for the work done, requiring a very small amount of water to be supplied by the hydraulic system. A pressure of 1200 pounds per square inch will be required to do the shearing, which can be supplied from an ordinary hydraulic accumulator system. The final compression is accomplished by an intensifier, making use of the 1200-pound water pressure. The compression of the billet calls for a very small fraction of the stroke of the machine. The use of the intensifier therefore increases the efficiency of the machine and brings the process within the scope of ordinary hydraulic practice.

Mr. Hughes estimates the cost of installation of the plant for the process for such a purpose at less than

gether to resist what they deem the unwarrantable encroachments of the labor leagues. In most cases shorter hours and higher wages are demanded, but as a rule these would be acceded to. What the wholesale trade generally and the manufacturers stand out against is not so much shorter hours and higher wages, but the demand of the unions that none but their members shall be employed in places where the unionists are employed. This the employers declare they will never agree to, that they will never consent to have any man or body of men dictate to them as to whom they shall employ. So the matter stands, and although all parties to the contest have not yet locked horns it does not seem to be a matter of more than a week or so until they will. In fact some are only waiting for the departure of the President until they do so, and considerable pressure had to be brought to bear before this would be assented to. The danger is that the extent of the strike may be increased, owing to the fact that employers generally are organized to resist the unionizing of their establishments, and that nearly every line of business in the city witnesses the organization of its employees in a union. One of the latest developments of this has been the formation of unions among the porters employed in mercantile establishments, &c., and new organizations are being formed every day. As the establishments engaged

in the manufacture of metal products, the foundries, machine shops, &c., are practically unionized, it might be hoped that they will be exempt, but now comes the great machinists' strike. All things considered, we can hardly hope to pass through altogether unscathed. But even though we should the general disturbance of business incident to the threatened strike would of itself badly affect the iron, steel, hardware and other lines in the metal business, as all this produces a state of general unrest and unsettles the views of everybody.

As an offset to this I may mention that the rains have been so beneficial and so widely extended over the State that we will have average crops and the outlook for the fall business, if we could only settle the strike situation, is very good. The oil business has not been quite so active of late owing to the greatly increased production and the haste which some producers show to bring oil on the market. This has depressed said market until I have been told on what I look on as good authority that oil in some cases has been sold as low as 20 cents a barrel at the well and even less. This has given a setback to business in oil stocks, but it is only temporary, as matters will soon right themselves. In the meantime the formation of companies, the sale of development stock and purchase of rigs, principally of articles sold by the hardware trade, goes merrily on. Indeed, the sales will probably be greater in the future than in the past, as the substitution of steel wire rope for cordage—used in drilling—is being agitated. Indeed, it is claimed that, everything considered, a steel wire rope is much the cheaper.

J. O. L.

### Notes from Scotland.

GLASGOW, May 10, 1901.—Notwithstanding the opposition both in Parliament and out, yet the export duty on coal is being enforced. It is now an established fact, whether for good or evil, and there is, of course, great difference of opinion what its ultimate effect on the general trade of the country will be. So far the principal effect has been to set down coal freights by about a shilling a ton, which means that at present the burden is being borne by the shipping of the country. It will not rest there finally, but in the meantime this effect will operate against the placing of new contracts for ships. The result of the duty on the Scotch coal trade can hardly be otherwise than bad, for Scotch coal is lower priced than either Northumbrian or Welsh coal, and in the markets of Northern Europe has to compete with both Newcastle and Germany. So far, however, little effect has been seen, for the coal shipping season has just begun, and exporters are busy on their contracts, while the drop in freights has enabled them to pick up a few more orders in spite of the duty. When the bustle of the season subsides, however, the shrinkage in exports will be felt, and the output will have to be reduced. Meanwhile the efforts of coal owners to get down wages have had to be suspended. The Conciliation Board met this week to deal with the application of the masters for a reduction of 1 shilling per day, but agreed to adjourn the discussion for a fortnight in view of the disturbance caused by the coal duty.

The miners of Scotland agree with the miners of England and Wales in thinking that the export duty will ultimately be paid out of their wages. Therefore, when the Miners' Federation of Great Britain proposed that if the House of Commons confirmed the tax there should be a general stoppage of all the collieries in the country, the Scotchmen sent delegates to the conference to concur. But there was found to be something far from unanimity among the English miners. The House of Commons did confirm the tax—could hardly do otherwise, in fact, in face of such a threat against the State—but the general stoppage has not occurred and is not likely to occur. The prospect of such a stoppage, however, has had a very bad influence on trade, and even if this trouble is got over here in Scotland, the questions of wages and of the five-day policy are suggestive of evil to come. Thus the iron trade, business being depressed in the present, is clouded as to the future in respect of fuel.

Ironmasters continue reluctant to light up furnaces with coal in such an unsettled condition. There are now only 76 furnaces in blast in Scotland, as compared with 85 a year ago, and there are only some 60,000 tons of Scotch G. M. B. in Connal's warrant stores. Yet so reduced is the home consumption, and so slack is export demand that warrants range only between 54 shillings and 55 shillings, with prices of makers' iron in proportion. At present prices smelters say there is no margin, for furnace coal is only 4 shillings down as compared with last year at this time, and that does not by any means represent the drop in pigs in the same period. Still greater, relatively, than the decline in pigs has been the decline in finished iron and steel. At £5 15s. steel ship plates are pretty close down to the bottom level from which they started, when both coal and pigs and wages were very much lower than they now are. In no branch of the trade can the situation be regarded as satisfactory, and in no branch can the outlook be considered hopeful. We continue, nevertheless, to hope for the best and there is always the consolation of knowing that although orders for new ships are not coming in as fast as we would like, still they are coming, and there is enough work on hand in most of the yards to keep them well employed for the rest of the year. The new orders booked in April represented more than twice the tonnage launched, and more orders have been placed, since this month opened, of the "liner" class. Where the effect of depression in freights is felt is in the demand for cargo "tramps." Then the Clyde looks for a good round share of the new Admiralty orders to be placed during the autumn.

To revert to pig iron. Although the number of warrants in circulation is small—only 55,000 tons of Scotch and 70,900 tons of Cleveland iron—there has been a good deal of "bearing," which accounts for the comparatively high range of prices. That Cleveland warrants should be so much lower relatively than Scotch (46 shillings as against 54 shillings 6 pence, the normal difference being 5 to 6 shillings), is due to the fact that Cleveland iron has been going into store, while Scotch iron is coming out. At the moment the Middlesbro public stock is about one-fifth larger than the Glasgow public stock—a quite unprecedented position. The large difference in price permits of a larger importation than usual of Cleveland iron into Scotland, where it is used for foundry purposes in mixture with Scotch iron. As a medium in speculation, moreover, Cleveland warrants are now attracting more attention than Scotch—though how small is the arena compared with the time when Connal & Co. held in their Glasgow stores 1,250,000 tons on warrant! And it is noteworthy that of late some considerable purchases have been made in Cleveland warrants for American account—not, it may be presumed, with a view to possible shipment to America, but as a speculative investment on the theory that a rise in prices here must result from the comparative scarcity of pig on both sides of the Atlantic and the sustained demand on your side.

As operating against a rise here, an interesting incident has now to be mentioned. There has arrived in the Clyde this week a cargo of 3500 tons of pig iron from Sydney, Cape Breton. This is the first fruits of the new plant erected by the Whitney Company, for the smelting of Newfoundland ironstone, with Nova Scotia coal. It comes over at a 10-shilling freight and it pays about 5 shillings per ton in harbor dues and landing charges, &c., but it also comes with a bounty of 20 shillings per ton to the exporters from the Dominion Government. The bounty thus exceeds the cost of transport and delivery, and is enough to cover commission and other business charges as well. What the iron realizes here, therefore, will be practically net prices to the manufacturers. Now the quality, in so far as it has yet been tried, appears to correspond with, or at all events to approximate to, that of Cleveland ordinary iron. That is to say, it is suitable for foundry purposes. If equal to Cleveland iron it will be worth here say about 52 shillings per ton, but a new article has always to accept a lower price than an established brand. At what price the Cape Breton iron is being placed here, I am not yet



in a position to say. It is not yet delivered, but several large consumers are making trial purchases. My point, however, is this: That if Cleveland makers can with a profit sell ordinary foundry iron at a price equal to 52 shillings in Glasgow, the Cape Breton works can deliver here at a lower price and have a much larger profit. That, of course, depends largely on freight, and that transport can always be effected at 10 shillings per ton seems to be exceedingly doubtful. In any case, however, the arrival of this pioneer cargo is a matter of great interest. It may not unlikely become a regular business, but in the meantime there is a great curiosity to know how the quality will turn out as compared with United States pigs imported last year.

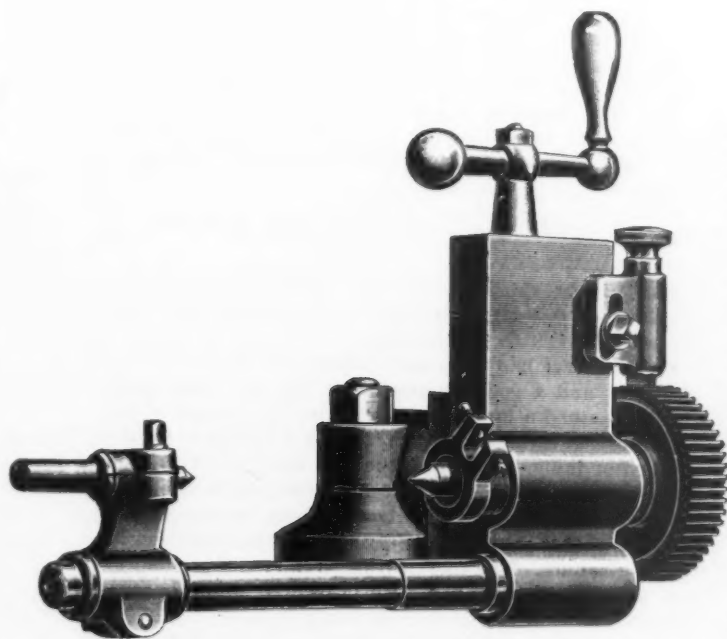
Some large extensions of station and siding accommodation by the Caledonian Railway Company, including the doubling of a bridge across the Clyde, will involve the consumption of a large quantity of steel within the next two years. The contract for this material has just been placed with the Steel Company of Scotland.

The International Exhibition, which was officially opened last week by the King's daughter, is attracting large crowds of visitors, and is evidently destined to be an immense success in every way. It still needs some finishing touches, however, in the mechanical section, some features of which I shall refer to later. It is generally acknowledged that never before has there been such a display illustrative of the progress of shipbuilding.

B. T.

### The Ideal Index Milling Attachment for Lathes.

The index milling attachment manufactured by the Ideal Machine Company of Hartford, Conn., may be



THE IDEAL INDEX MILLING ATTACHMENT FOR LATHES.

used on any engine lathe or on the cut off slide of a screw machine. With this device it is possible to flute taps and reamers, make cutters, "slab" bolts or screw heads, and do any light milling required in the tool room or small shops. It is held on the carriage of the lathe in place of the tool post, by means of a bolt, and is so constructed that tapering or diagonal cuts can be made by placing the centers in the desired position before clamping down. When in use the arm supporting the adjustable back center projects across the lathe on the left hand side of the carriage, the tool to be milled is held on the centers of the attachment, and the cutter is revolved in the lathe, preferably on an arbor fitted to the taper hole in the spindle. The device is fitted with an index plate and is also arranged to use the change

gears of the lathe. The engraving shows a gear in place of the index. The index furnished will divide for 2, 3, 4, 6, 8, 12, 16, 24 and 48 teeth.

### The Organization of the American Bridge Company.

The American Bridge Company, one of the constituent concerns of the United States Steel Corporation, consists of two organizations, the American Bridge Company of New Jersey, who are the main company and manufacture at the different plants bridges, buildings, &c., and the American Bridge Company of New York, who sell and erect such structures, the latter of course being controlled by the former company.

The American Bridge Company of New Jersey have elected the following officers and Board of Directors:

President, A. J. Major.  
Vice-President, finance, Wm. H. McCord.  
Vice-President, contracting, J. A. Hatfield.  
Vice-President, engineering, C. C. Schneider.  
Chief Engineer, Paul L. Wolfel.  
Mechanical Engineer, James Christie.  
Auditor, C. C. Price.  
Treasurer, Wm. H. Connell.  
Secretary, H. Schoonmaker.

#### DIRECTORS:

A. J. Major,	E. A. Muench,
August Ziesing,	Charles M. Schwab,
James Christie,	Abram S. Hewitt,
Paul L. Wolfel,	Elbert H. Gary,
Robert J. Davis,	Percival Roberts, Jr.
A. L. Schultz,	

The American Bridge Company of New York are organized as follows:

President, J. A. Hatfield.  
Vice-President, Aug. Ziesing.  
Vice-President, C. C. Schneider.  
Chief Engineer, S. P. Mitchell.  
Auditor, C. C. Price.  
Treasurer, Wm. H. Connell.  
Secretary, H. Schoonmaker.

#### DIRECTORS:

J. A. Hatfield,	A. J. Major,
C. C. Schneider,	A. W. Bryan,
Jas. A. Huston,	C. M. Schwab,
Aug. Ziesing,	S. P. Mitchell,
J. P. Kennedy,	Percival Roberts, Jr.
E. A. Muench,	

Turning first to the *personnel* of the American Bridge Company of New Jersey we may state that A. J. Major was originally in the bridge contracting department of the Pencoyd Iron Works; later was general Eastern manager of the plants of the American Bridge Company on the operating side, and has now become president, succeeding Percival Roberts, Jr.

The vice-president in charge of finances is W. H. McCord, formerly of Post & McCord, the well-known builders and contractors for the erection of buildings in this city.

The first vice-president in charge of contracting, who at the same time is the president of the American Bridge Company of New York, is J. A. Hatfield. Mr. Hatfield was for many years general sales agent of the Pottstown Iron Company of Pottstown, Pa., later was in charge of the New York office of the Pencoyd Iron Works, and upon the organization of the American Bridge Company became assistant to the president.

C. C. Schneider, vice-president in charge of engineering, and also vice-president in the American Bridge Company of New York, is a widely-known civil engineer, who has been consulting engineer of the Pencoyd Iron Works for a number of years.

The chief engineer of the American Bridge Company of New Jersey and therefore in charge of all the manufacturing operations is Paul L. Wolfel, who was formerly assistant chief engineer at Pencoyd and later chief engineer of the Eastern operating district of the American Bridge Company.

James Christie, the mechanical engineer, is widely known in the engineering world. It is he who recently celebrated the twenty-fifth anniversary of his connection with the Pencoyd Iron Works.

The auditor of both companies, C. C. Price, has been long connected with the Pencoyd Iron Works.



W. H. Connell, the treasurer, was president of the Edge Moor Bridge Company before their absorption by the American Bridge Company.

The secretary of both companies, H. Schoonmaker, was formerly an attorney for the Erie Railroad.

In the Board of Directors is August Ziesing, who is also vice-president of the American Bridge Company of New York. Mr. Ziesing occupied a prominent position as chief engineer of the Lassig Bridge Company, then for some time was one of the leading consulting engineers of Chicago, and subsequently became manager of the Chicago office of the American Bridge Company. He is now in charge of the Chicago district, both in the operating and contracting departments.

Robert J. Davis was originally connected with the Union Bridge Company. He then became assistant general manager of the Eastern operating district of the American Bridge Company, and is now advanced to the post of manager of the Eastern operating district, with headquarters at Pencoyd.

A. L. Schultz was president of the Schultz Bridge & Iron Company of Pittsburgh, and upon the formation of the American Bridge Company became manager of the operating department of the Pittsburgh district, a post which he retains under the present arrangement.

E. A. Muench, one of the directors of the American Bridge Company of New Jersey, was connected with the Pencoyd Works and is now advanced from the post of assistant purchasing agent to that of the purchasing agent of the American Bridge Company.

The names of the other directors of the American Bridge Company of New Jersey, Charles M. Schwab, Abram S. Hewitt, Elbert H. Gary and Percival Roberts, Jr., are familiar to the readers of *The Iron Age*.

Turning now to the organization of the American Bridge Company of New York, who are the selling and erecting company, we have first, besides those already mentioned, the chief engineer, S. P. Mitchell, who formerly was engineer of erection of the Edge Moor Bridge Company and is now promoted to the post of chief engineer in charge of erection.

James A. Huston, one of the directors, was formerly president of the Toledo Bridge Company and is now in charge of the contracting in the Pittsburgh district.

Among the other directors, J. P. Kennedy was president of the Youngstown Bridge Company and is now prominently connected with the contracting department in the Ohio district. C. W. Bryan was chief engineer of the Edge Moor Bridge Company, became manager of the Pittsburgh contracting department of the American Bridge Company, and is now transferred as manager of the Eastern contracting department, with headquarters at New York.

It will be observed how thoroughly the experience of the men constituting the officers and boards of directors of these two companies has been utilized in selecting the right men for the different posts. In nearly every case the new appointment is a promotion, and while the Pencoyd Iron Works are largely represented officers have been chosen from a number of the other constituent concerns.

We may say that Percival Roberts, the former president of the American Bridge Company of New Jersey, has resigned to give his entire attention to his duty as a member of the Executive Committee of the United States Steel Corporation.

Charles Macdonald, one of the vice-presidents of the American Bridge Company as formerly organized and for many years president of the Union Bridge Company, retires from active business life.

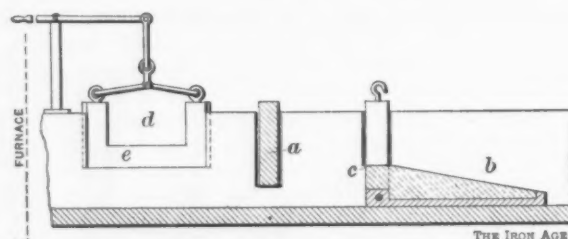
**Lockhart Iron & Steel Company.**—The statement in the Pittsburgh daily press recently that the works of the Lockhart Iron & Steel Company at McKee's Rocks, Pittsburgh, has been partially closed down on account of scarcity of puddlers is untrue. We may state that the plant of this concern has not been stopped since it resumed operations last summer after being closed down about a month for repairs, and the firm are so well supplied with both orders and employees that they know

of no reason why they should shut down for some time to come. This concern are makers of iron and steel bars, and their high grade iron bars from refined stock have a very high reputation in the trade.

### Improvements in Blast Furnace Iron Skimmers.

The skimming of iron at the blast furnaces was formerly considered an operation that required as much skill as keeping a good tapping hole, and many a cast of foundry iron has been spoiled for the market by the futile efforts of a green first helper to keep the cinder back. It is equally true that cinder ladles were frequently transformed into hot metal ladles by the failure of the first helper to raise the skimmer, when a rush of iron came, or perhaps he had time only to raise the skimmer and not the sand behind the skimmer. In case of the tapping hole coming out altogether, skimmer, dam and all were frequently carried down the pig bed. The iron plated, and the first helper needed to be quick to save himself from being badly burned. In the working of ores high in sulphur, or carrying appreciable quantities of lead, arsenic, &c., the skimming of iron was rendered still more difficult and even dangerous on account of the poisonous fumes.

In the manufacturer of Bessemer pig, where the practice of delivering the metal direct to the mill obtained, the presence of cinder on the ladles meant increased loss to the Bessemer department, which was sure to react unpleasantly for the furnace manager. What furnace manager has not had his bitter experience with a



THE BAKER BLAST FURNACE IRON SKIMMER.

"boil" at the skimmer, with the resultant loss of production and defeat of his purpose of making that week the record week in production?

After a cast had been successfully run with the sand skimmer and a good separation of slag and iron made there remained a large quantity of iron held back of the dam at the skimmer, which should be drawn to the pig bed or ladles by cutting the iron dam first and then the slag dam afterward; but how frequently the slag dam was cut so soon after that the iron went out with the slag, a fact that was plainly seen by the ebullition in the slag runner. The more furnaces the manager had to look after, the harder was it to prevent this loss becoming quite heavy.

The question might naturally be asked, But why could not this iron be removed from the slag when it was cold? Yes, it could be—but did you ever see a blast furnace slag dump where the evident loss of iron in this direction was not only too apparent to the careful observer?

The first improvement in skimmers was the introduction of the stationary fire brick barrier in place of the iron gate, which was raised or lowered by the first helper. This was a marked improvement, saving most of the arduous work of skimming and giving cleaner iron, but the danger from boils was still nearly as great, and the loss in cutting the dams after the cast was just as great. The first improvement was the Hartman skimmer, which appeared in 1893, in which an iron trough is used lined with bricks with cast iron skimming barrier, and with slag and iron dams air cooled. The slag and iron dams were hinged to lift up and drain the slag and iron out after the cast, either down the iron runner, or into the cinder ladles, an option which if left to furnacemen would in all probability result in loss of

iron with the cinder. Michael Killeen of Braddock followed a few years later with a skimming trough made entirely of iron with the dam cast as a part of the trough and the barrier of iron or fire brick. The problem of draining this trough he accomplished by the use of a gate in the side of the trough which is lifted, and the iron and cinder are drawn off into chilled beds or ladles at the close of the cast.

a, The skimmer designed by David Baker of the Illinois Steel Company, Chicago, provides no drain in the side of the trough for the metal above the dam, in order to make the waste of metal impossible, but has arranged a movable dam, b, which is lifted after cast to allow the metal to flow into the beds or ladles. The slag opening d in the side of trough is made low enough to drain the slag down to within  $\frac{1}{2}$  inch of the surface of the metal when it stands at the level of the iron dam.

In order to prevent rushes of iron during the cast from flowing out of this slag opening a casting, e, is laid in the opening to raise the slag overflow point about 4 inches higher, which casting is removed as soon as hole is closed and before the iron dam is raised. It is obvious that the slag by this means is drained off close to the surface of the iron, so that when the dam is raised only a little rushes down with the iron. The draining of the trough is so completely and quickly done by raising the dam s that it is frequently common for one skimmer and iron trough to be used a week without cleaning, the only labor necessary being the placing of the dam back in position and pointing the joints with clay.

The old method of cleaning the trough after every cast and making up skimmer is unnecessary. Furnace managers will appreciate what this means in the saving of labor in front of the furnace, making it possible for two helpers to easily handle the work in front of a large modern stack. The dam in this skimming trough is made of a refractory clay held in a shell of cast iron, which drops in notches in the side of the trough, and prevents the dam from being washed away in a rush of metal. In this shell are fastened the eye bars by means of which the dam is lifted after being started by a pinch bar. To accomplish this lift quickly a pulley is put on the roof trusses of the cast house, and a rope is carried over to a counterbalance weight at side of the building. This weight is supported so that the rope leading to the dam is slack while the skimmer is in use, but is tripped when the dam is to be raised, bringing a tension on the rope attached to the dam a little greater than the weight of the dam. At the same time the first helper with a pinch bar under the projecting shoulder of the dam gives it a start, when it rises very quickly.

The steps of the operation of draining this skimmer are as follows: As soon as the gun is applied to the hole, or, where hole is shut by hand, when the blast is off, the slag dam is raised by a lever with a pipe handle swiveled on a stand close to the trough. This operation allows slag to flow off close to the surface of the metal in the trough. After the tap hole is shut the iron dam is raised, and the iron with only a small quantity of slag on it is flushed down into the cast house or to the direct metal ladles as the case may be.

To recapitulate: The Baker skimmer, in addition to rendering the boil an impossibility, saves all the iron behind the dam after casting, which amounts to about 2 tons each cast, and delivers it into the product without extra labor and free from slag.

A bill has been introduced into the Florida Legislature to incorporate the Florida Ship Canal Company to construct and operate a ship canal across the Peninsula of Florida to connect the Atlantic Ocean with the Gulf of Mexico. The plans of the company contemplate the construction of a canal, beginning at a point on the Atlantic Coast at or between Amelia Island and Biscayne Bay, and terminating at some point between Deadman's Bay and Cape Roman on the Gulf Coast. The capital stock of the company is placed at \$100,000,000, and the incorporators named are F. A. Hendry, George W. Willson, John E. Hartridge, John E. King, N. Barco and A. S. Mann.

### Dust in Blast Furnace Gases.

Adolph Greiner, the general manager of the Cockerill Works at Seraing, Belgium, read the following paper at the recent meeting of the Iron and Steel Institute:

The present paper is a sequel to the communications I have had the honor of presenting to this institute on certain former occasions—in particular, the May meetings of 1898 and 1900. Its object is to complete the information which may be found useful to all persons interested in the employment of blast furnace gas in gas engines. From another more personal standpoint, it will serve to acquit me from the undeserved reproach of having incorrectly stated that gas engines on the Cockerill-Delamare plan could utilize raw, unpurified blast furnace gas.

To begin with, I wish to remark that my former communications have never had any other basis than facts—proved in each case, and were not founded on more or less hazardous speculation. In saying, as I did at last year's spring meeting, that we had at Seraing a 200 horse-power engine, driving an electric motor since April, 1898, without the cylinder having been once cleaned, I simply enunciated a positive fact, and I may add that now, after three years' continuous work, the engine runs day and night without having had to be stopped even once for the purpose of cleaning the cylinder. Experience showed us later on the cause of this result, with which I shall deal presently. On the other hand, the 600 indicated horse-power gas blowing engine, of a similar type to the one exhibited last year in Paris, did not meet with any difficulty in working, and my last communication of May 9, 1900, was simply a statement of practical results obtained at our works.

We had hardly started, however, in August, 1900, with the first of nine 600 horse-power engines at Differdingen, Luxemburg, than, after three weeks' running, we experienced the fatal results of the excessive quantity of dust contained in the blast furnace gases at these works. We were thus led to examine the amount of solid matter impregnating the gas, and to our astonishment found at Differdingen from 4 to 5 grams per cubic meter, while similar researches made subsequently at Seraing did not reveal the presence of more than from 0.25 to 0.50 gram in the gases from our own furnaces, or, say, ten times less than at Differdingen. The cleansing of the gas thus becomes a necessity, and we shall see further on how an absolutely perfect and extremely simple solution of the problem was discovered. We were thus led to look more closely into the nature of the gases outside Seraing, and I propose to make known the results ascertained by our chemist in eight or ten establishments where he was allowed to analyze the blast furnace gases for dust.

The first remark called forth by these results is that the degree of pureness of blast furnace gases varies greatly with different works, and this is easily to be understood from the different natures of the ores smelted. Generally speaking, the gases are purer in works producing hematite pig irons from hard ores in lumps, or mixed with purple ores, when, as is the case at Seraing, the dust from these last (always rather heavy) is deposited in the pipes and chambers nearest the blast furnaces, and is not carried any very great distance. On the contrary, the gases contain large quantities of fine dust in works which deal with oolitic ores, whose impurities consist mainly of a kind of clay which the heat causes to dry, and which the gaseous current carries to great distances—such being the case at Differdingen, and in general throughout the Luxemburg district.

A second important remark is the following: It is a mistake to suppose that the dust can be efficiently separated by depositing in long passages, vertical pipe arrangements, or chambers of large capacity. The dust is often reduced to such a state of tenuity that the gas continues to carry it in spite of all checks of the kind referred to, and the clouds of white smoke issuing from the tops of high chimneys prove that the gas after traveling hundreds of yards still contains appreciable masses of light solid matter.

I will now proceed to describe how the cleansing of



the gas was accomplished at Differdingen. A choice had to be made between two methods. The first, which may be termed the "static" method, consists in the use of a series of scrubbers or sheet iron towers containing coke or sawdust, cooled by a spray of water, which plan, first introduced by Mr. Thwaite, is in use in England, and also under different forms at the Oberhausen blast furnaces in Germany, at Dudelingen, in the Grand Duchy of Luxemburg, and elsewhere. This method is somewhat cumbersome and costly to put down, requiring the use of an aspirating fan or exhauster, but it gives perfect results as regards cleaning, as may be seen from the tests made at Dudelingen and recorded in the accompanying tabular statement.

being brought into the fan contained 4 grams of dust per cubic meter, leave it containing only 0.25 gram, and are in a proper condition for use in a gas engine without further treatment. The quantity of water required is very small, and varies with the degree of cleanliness to be obtained. With 10,000 liters of water per hour the dust in the gas can be reduced to 0.30 gram per cubic meter, and with 15,000 liters to 0.20 gram. The apparatus takes up little room, and is by no means costly. For an outlay of 10,000 francs the gas can be cleaned for six 600 horse-power engines. Mr. Meier, the general manager of the Differdingen Works,\* intends to carry out more completely the cleansing operations, by sending the gases leaving a first fan through a second one; experi-

Works.	Nature of ores.	Quality of iron made.	Gas on leaving furnace.		First distance to which the gases are led.	Approximate cross section in square meters.	Dust remaining per cubic meter.	Temperature C.	Second distance to which the gases are led.
			Dust per cubic meter.	Temperature, Celsius.					
Roechling, Völklingen	Oolitic ores of Luxemburg and Lorraine.	Basic.	13.6 gr.	50°	160 m.	8	2.88 gr.	35°	.....
Aumetz-la-Paix (Furnace No. 1) .....	Oolitic ores of Luxemburg and Lorraine.	Basic.	4.5 gr.	103°	15 m.	12½	4 gr.	65°	100 m.
Aumetz-la-Paix (Furnace No. 3) .....	Oolitic ores of Luxemburg and Lorraine.	Basic.	8.3 gr.	190°	15 m.	12½	7.90 gr.	160°	100 m. with water sprinkled.
Rothe Erde, Esch s/a (Furnace No. 3) .....	Oolitic ores of Luxemburg and Lorraine.	Basic	Not analyzed.	Not analyzed.	35 m.	4.0	4.6 gr.	135°	140 m.
De Wendel, Hayange.....	Oolitic ores of Luxemburg and Lorraine.	Basic.	6.3 gr.	60°	160 m.	4.9	5.2 gr.	50°	130 m.
De Wendel, Hayange.....	Oolitic ores of Luxemburg and Lorraine.	Basic.	6.3 gr.	60°	160 m.	4.9	5.2 gr.	50°	130 m.
Works of Dudelange. ....	Oolitic ores of Luxemburg and Lorraine.	Basic.	5.10 gr.	100°	180 m.	8.2	4.75 gr.	51°	Scrubbers with wood wool, 40 m.
Oberhausen .....	Swedish hematite and minettes.	Basic.	5.80 gr.	120°	Water sprinkled 50 m.	3.2	3 gr.	10-12°	180 m.
Cockerill .....	Spanish ores and purple ore.	Bessemer.	3 gr.	160°	20 m.	5	1.96 gr.	135°	50 m.

Works.	Approximate cross section in square meters.	Dust remaining per cubic meter.	Temperature.	Third distance to which gases are conveyed.	Approximate cross section in square meters.	Dust remaining per cubic meter.	Temperature.	Final distance to which gases are conveyed.	Approximate cross section in sq. meters.	Dust remaining per cubic meter.	Temperature.
Roechling, Völklingen.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Aumetz-la-Paix (Furnace No. 1).	3	3 gr.	50°	.....	.....	.....	.....	.....	.....	.....	.....
Aumetz-la-Paix (Furnace No. 3).	3	7.55 gr.	50°	.....	.....	.....	.....	.....	.....	.....	.....
Rothe Erde, Esch s/a (Furnace No. 3) .....	4.9	3.3 gr.	103°	.....	.....	.....	.....	.....	.....	.....	.....
De Wendel, Hayange.....	6	4.4 gr.	55°	.....	.....	.....	.....	.....	.....	.....	.....
De Wendel, Hayange.....	6	3.7 gr.	50°	.....	.....	.....	.....	.....	.....	.....	.....
Works of Dudelange .....	Scrubbers with wood wool, 4.9	1.84 gr.	11°	20 m. (two scrubbers with wood wool) 60 m. + gasometer 300 cubic meter capacity	4.9 (two scrubbers with wood wool)	0.375 gr.	10°	100 m.	3	0.230 gr.	10°
Oberhausen .....	2.8	0.478 gr.	7-10°	.....	.....	0.363 gr.	7-10°	.....	.....	.....	.....
Cockerill .....	10	0.98 gr.	115°	110 m.	4	0.51 gr.	35°	water sprinkled 30 m.	4	0.33 gr.	24°

The second method, which we should qualify as the "dynamic" one, is based upon a reaction due to centrifugal force provoked between the gaseous mixture and a spray of water injected into a suitable apparatus. The liquid and solid particles thrown against the periphery of the apparatus are expelled by an opening in the envelope, while the gases, which have been mixed and agitated by the action of rotating blades, escape through the exhaust orifice in a perfectly purified condition. Different analyses made at Hörde on gases treated by M. Theisen's apparatus leave no doubt as to this result, the quantity of dust per cubic meter of gas being sometimes reduced to less than 0.01 gram. At Differdingen the principle of "dynamic" cleansing has been very simply carried out by using an ordinary centrifugal fan, 1.50 m. in diameter, running at a speed of 900 revolutions per minute, through which the whole of the gases are passed, being drawn in by the central apertures. Water is supplied by a pipe 28 mm. in diameter, opening into the axial part of the fan. The gas alone is driven out by the fan discharge, the water, charged with dust, being led off by a pipe 50 mm. in diameter from the lower part of the fan casing. The gases, which before

ence can alone decide whether this improvement is necessary. It may be of interest to point out that the "dynamic" method of cleansing possesses the advantage over the ordinary one of supplying the gas at a certain pressure (from 20 to 25 cm. water gauge), by which it becomes possible to carry it in sufficient quantity through pipes of comparatively small diameter, and thus reduce the first cost.

In conclusion, facts have shown that the cleansing of blast furnace gas can be effected by simple and economical means. No reason exists why the principle should not be carried further and the gases cleaned before use in the blast heating stoves or boiler flues. I venture to call the attention of all blast furnace owners to the immense economy to be realized by this process, which constitutes a new advance in furnace management—so true is it that progress in one direction always calls forth concomitant results in another.

A new floating dry dock was launched at Havana on Monday. It will accommodate vessels of 6000 tons, and will be ready for use in about two months.

# The Iron Age

New York, Thursday, May 23, 1901.

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## Activity in Making Improvements.

The improvement of manufacturing plants is an important element in current industrial activity. Few are aware how general is this movement unless their business brings them into contact with it. Hardly a manufacturer can be found who is not enlarging his facilities, adding to his equipment, displacing old machinery with new, or introducing more modern ideas in some department. The bigger the plant the more likely is it to be in process of radical improvement. And the more rushed with work, the more are additions or improvements being rushed. It is much more expensive to make changes, additions or enlargements in such times as these than when trade is dull and factories are not pushed for prompt shipments, but with profitable business in sight the increase in cost is not permitted to operate as a bar to anything promising an early increase in production.

Taking the large blast furnaces and steel works, single engines are being compounded, noncondensing engines are being made condensing, and steam plants are being enlarged and fitted with better feed water heaters and economizers, thus securing greater power and higher efficiency throughout these plants. Manufacturers in other lines are no less enterprising, frequently installing engines of a size that but a few years since would have been considered phenomenally large for such undertakings. These also involve better steam plants and auxiliaries. Paralleling the developments in engines and steam plants is the enlargement of electric power. Works which began the use of electricity in a tentative way a few years since are doubling or trebling their generating capacity and finding new directions in which the increased power can be effectively applied. Notwithstanding the increasing use of electric current, and theoretically the interference with the sale of shafting and belting, the manufacturers of power transmission appliances are benefiting greatly from the improvement of factories as well as the building of new plants, and see no immediate danger from the independent machine driving motor. All along the line, in brief, the manufacturers who furnish equipment to other manufacturers are reaping a rich harvest from the prevalence of the spirit of improvement.

In this connection an interesting tendency of the times may be noted. This is an increasing disposition to enlist the services of the specialist, including under this denomination both consulting engineers and manufacturers who make specialties in machinery. The expert engineer, who is devoting his talents and experience to the attainment of better results in any branch of manufacturing, finds his services in constant demand with those who are making improvements. Not long since the machine shop connected with large manufacturing establishments would be operated to a great extent on new work. If anything in the nature of machinery was desired by some department, from a boiler pump to a locomotive, the foreman of the machine shop was expected to turn it out, and if it cost something more than a similar article purchased outright, the extra expense

was deemed a good investment in keeping up the machine shop organization. Usually, however, it was figured that some saving was effected. This practice is no longer common. Repair shops are now almost exclusively devoted to such work, seldom undertaking anything which can be purchased from manufacturers making a specialty of the desired article. The machinery specialists have made their work desirable by improvements and new devices or by attractive prices, and manufacturers who wish to have their plants in the best possible condition cannot afford to overlook these points.

## An Example of English Metallurgical Practice.

What to the average American iron maker is a most extraordinary state of affairs was revealed at the last meeting of the Iron and Steel Institute, a partial report of which has come to hand. One of the papers presented was by Axel Sahlin, who has been engaged for some time in trying to introduce American blast furnace practice as the manager of a large plant in the Cumberland district. Mr. Sahlin was called upon to build a new furnace, using the admirable raw materials of the district, and expected with a modern furnace, with 14-foot hearth, to be able to produce about 400 to 450 tons per day. An examination of the sales books for two years, however, showed the fact that the customers of the company, the Bessemer and open hearth steel makers, usually called for over 2 per cent. of silicon, and a few insist upon 2.5 per cent. Mr. Sahlin endeavored in vain to secure the authority to reason with the buyers, and finally was forced to cut down the size of the hearth to 11 feet, and thus limit his daily production to about 200 to 250 tons. Mr. Sahlin in his paper recounts the circumstances and before the foremost technical body makes a plea for lower silicon specifications in Bessemer pig—a plea we must confess sounds very strange to American Bessemer makers, who are usually in trouble only when they go below 1.25 per cent. in their efforts to make a cheap iron.

As it happens, Mr. Sahlin's position is illustrated in the most striking manner by another paper, read at the same meeting, by J. M. While, who describes the new Bessemer shop and heating pits at the Barrow Steel works, in the very district in which Mr. Sahlin's plant is located. Casting on cars and some other American wrinkles are adopted and some important reductions in cost are reported in detail. The paper concludes, however, with the following uncomfortable experience in trying to "emulate American practice." We quote literally:

"As is well known to most members of this institute, there are many difficulties to overcome when radically changing the system of working, but in addition to those ordinarily met there was one unforeseen, which was so important as to be worth relating.

"When it was first decided upon to put in the most modern Bessemer plant, the idea occurred that we should emulate American practice, and blow our heats in less time than was customary in this country, with the further objects than those already specified of saving fuel, wear and tear of our plant, and the life of the converter lining and bottoms; and in order to do this with the same pressure of blast as we had hitherto used—viz., 25 pounds maximum—we so increased the diameter of the converter bottom as would enable us to use a larger number of tuyeres and have a shallower bath. The converter was therefore designed to hold conveniently 20 tons of metal, and the bottoms to have 33 tuyeres, each tuyere having 19 holes of 5-16 inch diameter, or about



the same blowing power per ton as the smaller vessels had.

"It was hoped that this shallower bath would so shorten the 'blow' that the converter bottoms and lining would run for a longer period, probably 20 to 30 blows. The result was contrary to our expectations; for while we were able probably for the first time in this country to blow our heats in ten minutes, and in some cases eight minutes, the blow was so hot as to be practically unmanageable even when cooled by steam and large quantities of steel scrap. The amount of material thrown out of the vessel equaled from 20 to 25 per cent. of the charge. The steel was so hot as to destroy the bottoms and molds in one cast, and the resulting steel worked badly. The converter bottoms being then made of ganister lasted only one or two heats, and the lining of the converter fared badly. It was, of course, seen at once that fast blowing for the iron we had at command was not practicable; we therefore reduced the number of tuyeres to 27, and increased the depth of bath. This caused the time of blowing to extend to 15 minutes, but it was not until we further reduced the tuyeres to 24 and increased the time of blowing to from 20 to 25 minutes, and still further increasing the depth of the bath, that we obtained the present advantage from our Bessemer shop, and made steel of the best and most uniform quality.

"One object in giving the above information is that it may be known the faster working in vogue in the United States cannot be introduced into England with advantage, for the same conditions do not apply in each country."

If ever Mr. Sahlin needed testimony in proof of his statement as to the attitude of the English Bessemer steel makers, the paper quoted abundantly furnishes it. It never seems to have occurred to Mr. While that if his blow was too hot a simple and cheap remedy was at hand by reducing the silicon contents of his iron.

We have the extraordinary spectacle of a furnaceman forced to cut down his make of iron because the steel makers specify an excessive amount of silicon, and the Bessemer manager deliberately reducing his output because he was using an iron altogether too high in that expensive agent of combustion.

If England's metallurgical practice has not progressed beyond such a stage, her effacement as a producer of steel on a large scale is closer than her worst enemies ever dreamed. Obviously a Garrett is needed in this branch, too.

#### Uneasiness Among Plow Makers.

The *Farm Implement News* of Chicago makes a serious charge against those who are endeavoring to effect a consolidation of the plow manufacturers. Referring to the fact that the promoters have failed to interest some of the largest plow makers, the journal in question states that this has probably inspired an attempt to gather in the smaller manufacturers, who, until recently, were not seriously considered, and further says: "It is reported on good authority that one of the arguments used to swing them into line related to a certain important material used in steel plow construction—soft center steel, to be exact—and to the prospect which independent concerns might be compelled to face—inability to procure this essential line of material. One manufacturer who has thus far repelled all advances, and who did not come to Chicago either during or after the conference, declared that the matter has been presented to him in that light, and he frankly admitted that it caused him some uneasiness."

The charge thus made by the *News* has since been confirmed by information we have received from other sources. Plow manufacturers who have thus been threatened have appealed to independent steel makers to see that their interests are protected in case they decline to merge their business into the proposed consolidation. It is incredible that the Crucible Steel Company of America, who are almost the sole manufacturers of soft center steel, have assented to any such scheme as this. We agree with the *News* that the company would hardly "place themselves at the mercy of one customer, however large." The intimation that outside plow makers would find themselves short of material is really not a novel proceeding in getting up a consolidation. Such tactics have been pursued in a number of other instances, not always authorized by the chief promoters, but resorted to by others working for options and zealously for commissions. As in such cases the manufacturers who continued to operate independently found themselves still able to secure necessary raw material, so will the plow makers continue to find needed supplies still available. We have yet to hear of any instance in the iron and steel trades in which a manufacturer has been forced out of business for such a cause.

**A New Coke Oven Construction Company.**—The Retort Coke Oven Company have just been organized in Cleveland, Ohio, for the purpose of building ovens for the manufacture of coke and the saving of by-products. John F. Wilcox, who has been the general manager and chief engineer of the United Coke & Gas Company of New York, has resigned his position with that company and will take the general managership of the new enterprise in Cleveland. Mr. Wilcox has been a pioneer in this branch of business in the United States, and has probably had more experience in this class of work than any one else in this country. S. T. Wellman of the Wellman-Seaver Engineering Company will be the president. The company have taken offices on the thirteenth floor of the New England Building.

The Jenisee Land Company of Pittsburgh have sold to some capitalists about 30 acres of land near Donora, on the Monongahela River, 35 miles from Pittsburgh, and the report is that the buyers will erect a steel plant of some kind. The ground is near the works of the Union Steel Company, but the officials of this concern deny they are interested in any way in the new company.

Through an accident in the converting department of the Bessemer plant of the Ohio works of the National Steel Company, at Youngstown, Ohio, a number of men were very seriously burned by overturned molten metal, and four of them have since died.

The Chicago office of the Rider-Ericsson Engine Company, New York, has been removed from 86 Lake street to more suitable quarters in suite 427 at 40 Dearborn street.

A press dispatch from Los Angeles, Cal., credits President Butler of the California & Oriental Steamship Company with the statement that the company are about to adopt petroleum for fuel on their steamships. The step, if taken, will mean much for the California oil industry.

Ernest O. Buddefelt, Muncie, Ind., has invented a machine to manufacture chains in one piece, and a company will be organized with \$100,000 to erect a factory at Whitely, near Muncie, for the purpose of using the machine in making chains.

The "King Edward," the first mercantile vessel to be fitted with turbine engines, was launched last week at the yards of Denny Brothers, at Dumbarton, Scotland. She is expected to develop a speed of 20 knots an hour.

### Worcester Industries.

WORCESTER, MASS., May 20, 1901.—The Worcester machine builders are not so busy as they were a year ago. A few of them are rushed at intervals, but as a whole the business is not so good. One reason given for the depression is that the Russian tariff, recently gone into effect, has destroyed one good market for Worcester tools. It is not that the machine shops are idle, but there is no working nights, as has frequently been the case in Worcester in times of good business. However, it is expected the Worcester shops will benefit by the machinists' strike, which does not affect Worcester.

The wire business in Worcester and vicinity continues to increase rather than to fall off. Every department of every plant is working night and day. Within a fortnight the Central works of the Washburn & Moen department of the American Steel & Wire Company has been started up nights. This plant had been idle until recently, but now all of the fine wire machinery has been placed in operation. The Wright & Colton Wire Cloth Company, the Morgan Spring Company and the Spencer Wire Company continue to be rushed with orders, and there appears to be no sign of the near approach of the usual summer depression.

A press dispatch from Pittsburgh, insinuating that the whole or a part of the Washburn & Moen Works might be moved from Worcester to be nearer the iron and coal regions, created some anxiety among employees, but the local officers of the American Steel & Wire Company assert there can be no grounds for apprehension of Worcester losing even a part of its greatest industry, in the announced plan of centralizing the business of the United States Steel Corporation. The American Steel & Wire Company have added more than \$1,000,000 to the plant in new steel furnaces, blooming mill and rod mills, besides several important departments to the works, and it is said by the Worcester officials that there can be no purpose in changing the location of the works.

Worcester is singularly free from any unions of steel and iron workers. There is no union of the wire workers, nor of the employees of the steel plant. Neither has the machinists' union made any success among the Worcester workmen. This is given as one of the arguments for the United States Steel Corporation increasing rather than decreasing the Washburn & Moen Works, which at the present time employ between 5000 and 6000 men.

The Richardson Mfg. Company, builders of agricultural machinery, report a very good season's business. An unusually large number of foreign orders have been filled, including large consignments to Germany, and one to India, in which latter country the company have established a considerable business.

The Plunger Elevator Company have received the contract for 13 freight elevators for the new building of the Merchants' Warehousing Company of Philadelphia. Each elevator will have an 88-foot lift. They are of the hydraulic type. The contract price is about \$75,000.

Two new companies for the building of automobiles in Worcester have been incorporated. One are the Crompton Motor Cycle Company, of which Charles Crompton, formerly with the Crompton & Knowles Loom Works, is the active spirit and the designer of the steam vehicle which the company will put on the market. A model machine is now being built, containing a number of original features, including an automatic water feed. They are a Massachusetts corporation with a capital stock of \$5000, which will be increased later.

The other new company are the United States Mobile & Power Company, a West Virginia corporation, who have already begun the manufacture of automobiles for the market in the Warren Machine Company's former shop. The officers are Henry E. Whitcomb, president; Vernon F. Prentice, vice-president; E. P. Sumner, treasurer, and W. E. Taft, general manager. Mr. Whitcomb is the head of the Whitcomb Envelope Company division of the United States Envelope Company and Mr. Prentice is president of the Prentice Bros. Company.

The Cahill Typewriter Company of Washington, D.

C., are to build a factory in New England, probably either in Worcester or Bridgeport, Conn. The type-writer is operated by electricity and is said by experts to be a great improvement over the type of machines in general use, for certain purposes. The touch of the key makes an electric connection which strikes the desired letter. Spacing can be done at the same instant as the striking of the last letter of a word, thus saving considerable time in the aggregate of a day's work by a type-writer.

The Worcester Mfg. Company have been organized under the laws of Maine to manufacture the Burnham window shutter, and have already started in doing business on a considerable scale. The officers are: President, Jerome Marble; vice-president, John W. Knibbs; treasurer, George M. Rice; secretary, William Lancaster. The Burnham window shutter is a device for shutting and locking window blinds in any position by pulling a chain inside the room.

All the business of the Warren Machine Company has been moved from Worcester to Berlin, Germany, to be part of the new plant of Rudolph Kirschbaum in that city. The company built the Warren universal drill. Mr. Kirschbaum acquires the patent rights on the device for the United States and foreign countries.

George I. Rockwood, mechanical engineer of Worcester, has designed an automatic water feed upon which he has secured patents. Its purpose is to regulate the feed of water in automobiles and in all types of water tube boilers, particularly those of torpedo boats and other war vessels. It is claimed for the device that water may be kept at a height never varying over a fraction of an inch. The by pass pipe of the automobile is done away with and in its place is a trap which takes the water from the boiler when it reaches a given height and keeps it circulating round and round until no longer necessary, when the trap closes and the regular feed begins to work again. It is possible to heat the water in the tank of a steam automobile before starting upon a journey, which increases the efficiency of the machine by husbanding the supply of fuel.

Another new Worcester idea is a water flow meter, designed by George I. Rockwood and Prof. C. N. Allen of the Worcester Polytechnic Institute. One has been finished and placed at the water privilege of the George N. Gilbert Mfg. Company on the Ware River, at Ware, Mass. The inventors will not give out details of the device. It registers upon a dial the integration of the motions of the water gate and the varying head of water. Mill privileges all over Central and Southern New England are being taken for purposes of water supply for cities, and the Ware River is soon to go for the purpose of increasing the water supply of Boston and vicinity, which led Mr. Gilbert to order the meter designed to keep a record of his water power for use when the time comes for the State to pay for his water privilege, the meter's record to replace the estimates of expert witnesses. The basis of the machine is the result of years of tests at the privileges of the Holyoke, Mass., Water Power Company.

The Steel Cushioned Hub Company are another new Worcester corporation, organized under the laws of Maine. The officers are: President, Fernando F. Stowe; treasurer, Henry K. Merrifield; directors, these officers and Judge T. Forbes of the Probate Court for Worcester County. The company will manufacture a patent hub, the invention of Mr. Stowe, which, it is claimed, takes the jar out of vehicles large and small. It has been tested on a heavy truck wagon, with a load of more than 4 tons. The device is a hub within a hub. In the inner hub, in which is the axle, is a powerful spiral spring, tested to sustain the weight of the desired load. The spring is parallel to the axle and works against a male cone, which in turn acts against a female cone in the outer hub. The result as ascertained by the tests is that the jar of passing over pavements, railroad tracks and obstructions is taken up in the spring and cones and is not transmitted to the outer hub. A bicycle has been fitted with hubs of this type and run more than 1000 miles, and the result was as satisfactory as with the



heavy truck. The men interested believe the device can be applied to all sorts of light vehicles, replacing the rubber tire in part, and especially to the automobile, where the vibration and jarring plays the mischief with the delicate machinery. Tests will also be made in applying the hub to electric and perhaps to steam cars.

The business of Witherby, Rugg & Richardson, manufacturers of wood working machinery, has been incorporated under Massachusetts laws, with a capital stock of \$60,000. The officers are: President, Gilbert J. Rugg; secretary and treasurer, George T. Witherby; directors, these officers and William H. Inman, A. W. Gifford and Moses S. Beaman. The business is an old one, but for the past few years has not been pushed, especially during the past year, when all orders for new machinery have been refused, because of complications resulting from the settling of the estate of a member of the firm. Now it is planned to push the business and continue the manufacture of various types of wood working machinery. The company own a large factory on Salisbury street.

The business of A. Burlingame & Co., engine builders at 22 Cypress street, has been reorganized and incorporated under Massachusetts laws, with a capital stock of \$20,000. The officers are: President, Henry C. Warren; treasurer, Rufus B. Dodge; general manager, Charles D. Parker. Mr. Parker is a mechanical engineer of large experience and a graduate of the Worcester Polytechnic Institute. He is a new factor in the A. Burlingame Company. The company will build a new type of Corliss engine, which it is claimed will be a novelty in factory engines, because by a new device the difficulty of the Corliss trip valve has been solved, and an engine designed to run at high speed, which has not previously been accomplished with this type of valve.

The Harrington & Richardson Arms Company are about to build a large four-story addition to their factory at Park avenue and Chandler street. The company added the manufacture of shot guns to their business last year, and the big new factory has proved inadequate in consequence. A large part of the new addition will be given up to storage purposes. J. N.

**G. A. Crosby & Co., Limited.**—G. A. Crosby & Co., Limited, of Ontario, Canada, is the name of a new corporation, who were recently organized to manufacture presses, dies and automatic canning machinery. The company will occupy the old Grank Trunk plant at Port Edward (Sarnia, P. O.), Canada, which consists of a main building, 60 x 450 feet, and two wings, each 60 x 100 feet. The main building will be used as a machine shop and foundry, and the wings will be used as a blacksmith shop and engine room. The officers of the company are J. L. Crosby, president; W. S. Cummings, vice-president, and Chas. Morrison, secretary and treasurer. Messrs. Crosby and Cummings are both well known to the Western trade, having previously been engaged in the same line of business under the name of Board-Cummings Foundry Company, and Geo. A. Crosby & Co. of Chicago. Mr. Morrison was formerly teller in the Commercial Bank of Port Huron, Mich. The shipping facilities of the new plant will be of the very best, being situated on deep water and on the Grand Trunk Railroad. The plant is expected to be in full running order by June 1.

**Manufactures in Rhode Island.**—The Census Office at Washington has published a bulletin showing the present status and the growth of the manufacturing industries of the State of Rhode Island and the cities of Providence, Pawtucket and Woonsocket. For the State at large the statement shows 4190 establishments, as compared with 3377 in 1890, with a capital of \$184,899,485, as against \$126,483,401 in 1890. The number of wage earners in 1900 was 96,949 and in 1890 81,111. Total wages paid in 1900, \$41,252,614; in 1890, \$33,239,313; miscellaneous expenses in 1900, \$12,227,664; in 1890, \$8,825,407; cost of materials in 1900, \$96,585,653; in 1890, \$76,253,023; value of products in 1900, \$184,498,000; in 1890, \$142,500,625. The value of products in Providence

was \$88,168,897 in 1900, as against \$77,467,283 in 1890; in Pawtucket, \$24,080,328 in 1900 and \$16,303,729 in 1890, and in Woonsocket, \$15,627,539 in 1900, as against \$9,613,264 in 1890.

### Great Britain's Pure Ore Supply.

In his address as president of the Iron and Steel Institute, William Whitwell, the well-known Middlesbrough ironmaster, took up as follows the question of a pure ore supply:

By far the greater part of our steel in this country is made by the acid Bessemer and Siemens processes, requiring a pure pig iron as low in phosphorus as possible. The question, then, of the supply of pure ore to make this class of pig iron is one which will have to be faced by us in the near future. Our only native supply of pure ore of the Cumberland district is rapidly approaching exhaustion. In many works the ore now used is of very much lower yield of iron than it used to be, and Spanish and other foreign ore is being imported in increasing quantities to help out the local supply. On the east coast and in other hematite iron making districts nothing but foreign ore is used, the greater part coming from Bilbao. We often hear reports of the near exhaustion of this famous deposit, and recently it was stated that the end would be seen within a few years' time. I have no means at hand for verifying this estimate, and the Bilbao exports of the last five years do not enlighten us. These statistics are taken from C. E. Muller & Co.'s annual report, and include the ore also shipped from north Spanish ports near Bilbao:

	Tons.		Tons.
1896.....	5,047,000	1899.....	5,864,174
1897.....	4,959,803	1900.....	5,268,429
1898.....	4,633,241		

Though there was a steady decrease from 1896, there was a sudden increase of over 1,000,000 tons in 1899, the highest export on record. Last year showed a decrease of 600,000 tons, but whether due to diminished supply or diminished demand we cannot tell. But with regard to the "quality" of the ordinary Bilbao ore which goes by the name of Rubio, I can speak more definitely from personal experience. The percentage of iron is steadily decreasing, and if the decrease goes on at the present rate it will not be long before this ore will be too poor in iron to pay cost of carriage and smelting. I have taken from the laboratory reports at Thornaby the average composition of the cargoes of this ore received in the last 11 years, 1890 to 1900 inclusive. Briefly it may be stated that whereas the average composition for 1890 was

	Per cent.
Iron in dry state.....	55.50
Moisture .....	9.00
Iron in the ore as received.....	50.50
Silica in the ore as received.....	7.10

The average for 1900 was

	Per cent.
Iron in dry state.....	52.80
Moisture .....	9.10
Iron in the ore as received.....	47.99
Silica in the ore as received.....	10.09

This decrease of 2.5 per cent. in the iron and increase of 2.99 per cent. silica in the ore as received may not at first sight appear very alarming, but if the effect on the weight of raw materials used in a year's working is considered the seriousness of the difference is more apparent.

To make a ton of pig iron, 1.821 tons of ore of the composition shown for 1890 would be required, but in 1900 it would be 1.917 tons. Our make at Thornaby approximates 125,000 tons of pig iron yearly, made from a mixture of which Bilbao Rubio ore forms half to two-thirds, but in order to more fully illustrate the deterioration of this ore we will suppose nothing but Rubio is used. Then, to produce 125,000 tons of pig there would be required 227,625 tons of ore in 1890, but in 1900 the weight of ore would have to be increased to 239,625 tons to make the same weight of iron, an increase of 12,000 tons. The comparison does not end here, however, for practically the whole of that 12,000 tons is increased

earthy matter which would have to be fluxed and passed off as slag. The silica in 1890 is 7.10 per cent., and in 1900 10.09 per cent., giving 16,160 tons and 24,178 tons of silica respectively in the weights of ore quoted above. This is an increase of 8018 tons. The proportion of silica to lime in a hematite slag (when the alumina is 12 to 14 per cent. and the magnesia 4 to 6 per cent.), is 1 to 1.45, so that this 8018 tons of silica would require 11,626 tons of lime, equal to 22,360 tons of limestone. This extra limestone and resulting extra slag would need more coke for the decomposition of the former and fusion of the latter, amounting to over 1 cwt. to the ton of pig, or 7500 tons for the year. Thus the decrease in the yield of the ore for 1900 as compared with 1890 causes an increase of 12,000 tons in the weight of ore, 22,360 tons in the limestone and 7500 tons in the coke, a total increase of 41,860 tons in the raw materials to produce the same weight of iron. Naturally such a condition of affairs would mean either very much increased rate of working or, what is more likely, a diminished output.

In the light of such a showing as this one naturally turns to the possibility of there being other deposits near at hand to help off or even become a substitute for Rubio ore. I myself, in the past 12 or 14 years, have tried several different kinds of ore, from various countries, with this object in view. The countries represented are Sweden, Norway, South Spain, Italy, Greece and North Africa. Though many have been very useful as a mixture for Rubio ore, it must be confessed that in no case have I found one which could be considered an efficient substitute. Either the composition, mechanical condition, costs of carriage or insufficient supply has been the stumbling block. When it is remembered that the total exports from Bilbao and other ports in North Spain to the northeast coast of this country last year totaled 1,708,167 tons, and from all other parts, South Spain included, only 655,829 tons to the same district, it is evident that unless these other sources are capable of very much increased output, insufficient supply will be the main difficulty in the event of the Bilbao district being worked out.

In the last few years magnetic concentration has been brought more prominently forward as a possible means of solving this question of the pure ore supply. The concentration of iron ore by this method has been successfully accomplished in Sweden and in the United States, but before the concentrates can be used in the blast furnace they must be made into briquettes, as the separated ore is in a dead fine condition, in which state it would be impossible to use it in the furnaces. This must add to the cost considerably, and only under most favorable conditions will it be possible to look for help in magnetic concentration. The improvements in the basic open hearth steel process that have already taken place and further improvements in the near future will soon make this class of steel cheaper than any other. Thus, in order that the acid process may compete with it it will be necessary to supply hematite pig at cheaper rates. Any one, therefore, who carefully considers what I have shown with regard to the supply of pure ore must see that the possibilities of a cheaper hematite pig are not very hopeful, but rather the other way, and the only conclusion we can come to is that this country will be compelled at no very distant date to adopt increasingly the basic process and the use of native ore more extensively.

**Atwell Machinery Company.**—The Atwell Machinery Company have been organized in Pittsburgh, and opened offices in Room 505 Hamilton Building, in that city. The concern will handle new and second hand machinery of all kinds, including engines, boilers, pumps, &c.

The Pittsburgh Chamber of Commerce have opened a campaign for a greater Pittsburgh, by the adoption of a resolution urging all the "boroughs, cities, townships and the commercial, financial and industrial organizations in Allegheny County to take such steps as may influence public sentiment and lead to legislation." Secretary George H. Anderson of the Chamber of Commerce says that if all the cities and boroughs properly

belonging together were consolidated, Pittsburgh would be fourth in population and second in manufacturing of all the cities of the United States.

**The St. Clair Steel Company.**—We may state that the above named concern, who are one of the constituent interests of the Crucible Steel Company of America of Pittsburgh, are making very rapid and satisfactory progress in the building of their new open hearth steel plant on the large tract of land which the concern recently purchased from Henry C. Frick, and located at Blair station on the Monongahela division of the Pennsylvania Railroad, about 25 miles from Pittsburgh. The site is said to be one of the finest for manufacturing purposes on the Monongahela River south of Homestead. The plans for the new plant have been completed, and the work of construction is in charge of the well-known engineers, the Garrett-Cromwell Engineering Company of Cleveland, Ohio. Horace W. Lash of the above firm, and a well-known open hearth expert, is in immediate charge of the construction of the open hearth furnaces and their appliances. The works at the start are to consist of 12 50-ton open hearth furnaces, a 40-inch blooming and billet mill, and a number of finishing mills. The product will be about 1200 tons of steel per day. The works are, however, being planned to admit of almost indefinite enlargement. All the important contracts, such as buildings, engines, blooming mills, shears, boilers, cranes and locomotives, have been placed with satisfactory promises of early delivery. The work of grading, track laying, excavating for building foundations, is being rapidly pushed and the ground will shortly be ready for the erection of the buildings and placing of the machinery. Unless some unforeseen delay occurs, the plant is expected to be making steel in the fall. When completed on the lines laid out, it will be one of the most complete and economical in operation open hearth steel plants built up to this time. The St. Clair Furnace Company, recently incorporated at Pittsburgh, and also a constituent of the Crucible Steel Company of America, of Pittsburgh, will, as their name implies, be devoted to the manufacture of pig iron to supply the open hearth plant of the St. Clair Steel Company and also the other 14 plants of the Crucible Steel Company of America. The furnaces will be built on part of the same tract of land containing the open hearth plant of the St. Clair Steel Company and will be of large capacity and most modern type. The principal contracts for their construction have already been let and the work of building the furnaces will be pushed to completion as fast as possible, and it is expected to have at least one stack turning out iron early in 1902. The St. Clair Furnace Company have made satisfactory arrangements for an ample supply of ore, coke and other raw materials, so that when this plant is completed the Crucible Steel Company of America will be able to place the product of their 14 works on the market at a minimum cost from the raw material to the finished product. James E. Tatnall, formerly superintendent of the open hearth department of the Bethlehem Steel Company, Bethlehem, Pa., has been appointed superintendent of the open hearth department of the St. Clair Steel Company, while G. G. Thorp, until recently general superintendent of the Joliet Works of the Illinois Steel Company, has been appointed general superintendent of the furnaces of the St. Clair Furnace Company and steel works of the St. Clair Steel Company. John A. Sutton, for many years connected with the Park Steel Company of Pittsburgh, has been elected secretary of both concerns, with offices in the Empire Building, Pittsburgh.

Alba B. Johnson, a member of the firm of Burnham, Williams & Co., owners of the Baldwin Locomotive Works, Philadelphia, denies absolutely that the works are to be absorbed by the American Locomotive Company.

The Republic Iron & Steel Company, at Youngstown, Ohio, have signed the scale of the roll turners' union. So far the American Steel Hoop Company, at Youngstown, have not signed the scale.



# THE MACHINISTS' STRIKE.

## Reports from all Sections of the Country.

In an irregular and uncontrolled manner machinists in all sections of the country are waging warfare against their employers for ten hours' pay in return for nine hours' work. While the preliminary steps were taken by the International Association of Machinists, the movement in certain instances has spread beyond their control, for, urged on by the success which union workmen had attained in various shops, the non-union workmen in other shops have pressed the demands of the union and are now holding together, although they are not affiliated with the organization. President O'Connell of the International Association has almost entirely lost control of the men, and the numerous lodges are patching things up to suit themselves, regardless of their president's dictum.

The disposition on the part of a few of the members of the National Metal Trades Association to concede the demands of the men had an ill effect upon the working of the organization of the employers at first, but now that the remaining members have gotten together the stand of the association has been strengthened materially, and there have been no further departures from the general course adopted by the association. In the most important manufacturing centers, especially in the West, local organizations of the employers are dealing with the matter in their city. In one instance the local organization compromised with the men, in other centers they are holding out firmly, and consequently the strike is most pronounced in these quarters. Such cities as have recently gone through labor disturbances are very quiet on the present question, and the men have either refrained from making any demands whatever or are willing to remain at work pending arbitration. In this respect Chicago, Cleveland and Paterson, N. J., are conspicuous. The first named city is practically undisturbed, because the men have decided not to strike until arbitration has failed. This is in compliance with the agreement entered into recently by the National Metal Trades Association and the International Association of Machinists. Cleveland has just gone through a molders' strike, from which the employers emerged victorious. Consequently the majority of the important shops are not affected by the present trouble. Paterson has also had a heavy infliction of strikes and lockouts and there is no trouble there now.

The New England States have come off surprisingly fortunate thus far. While in Boston and along the Naugatuck Valley there are a number of serious strikes, the machine tool builders in Worcester and other important manufacturing centers are undisturbed. The New York and the New Jersey section is placed in a most unfortunate position. Several concerns who were looked forward to as being strongest in refusing the demands of the men have given in, and as a result a large number of men who had not previously showed any disposition to cause trouble have gone out. There are also a number of firms who are holding out against the demands firmly, and in such shops the strike is on, full sway.

Pennsylvania is quiet, as the shops which were pressed have acceded.

Cincinnati is out strong. The local organization of the employers has refused to bend, and the men have struck at all of the important shops. Hamilton is quiet, no trouble having developed at the Niles shops as yet.

At Milwaukee the local association of manufacturers have the situation well in hand, and 95 per cent. of the machinists of the city are out.

The St. Louis Metal Trades Association has conceded

a 10-per cent. advance in wages and a nine-hour work day, and trouble was thus avoided.

At Denver, Col., the demands of the machinists were acceded to and now the pattern makers are on strike.

As has been previously stated in *The Iron Age* the cause of the strike is a sweeping demand for ten hours' pay for nine hours' work. This demand was made by the International Association of Machinists, and was aimed particularly at the shops affiliated with the National Metal Trades Association. The latter organization was thought to be immune from just such a situation as exists to-day, because it was operating under an agreement with the International Association of Machinists which, if lived up to by both parties, permitted grievances to be settled by arbitration. The employers have lived up to the letter and spirit of this agreement, but the action of the leaders of the machinists has shown them to be irresponsible to a straightforward compact to which they have affixed their signatures. The text of the agreement referred to has been printed in *The Iron Age*, and the proceedings of the meeting, at which President O'Connell of the Machinists' Association abrogated it, was given in the last issue of this publication. Briefly stated the matter stands as follows: On May 18, 1900, a joint agreement was entered into by the National Metal Trades Association and the International Association of Machinists in the Murray Hill Hotel, New York, which provided that from and after six months from that date 57½ hours shall constitute a week's work. From and after 12 months from the date of the agreement, 54 hours are to constitute a week's work. The hours to be divided as will best suit the employer. No provision was made regarding a change in the rate of wages. In order to obviate the possibility of a general strike, and to provide a course of procedure to be followed by both organizations in case of trouble, a resolution was adopted and signed by the officers of both organizations on November 16, 1900, at the Murray Hill Hotel, New York. This resolution provided that "when a dispute shall arise between an employer and his employee or employees every reasonable effort shall be made by the said parties to effect a satisfactory adjustment of the difficulty; and in case such difficulty cannot be settled between employer and his employee or employees it shall be referred on the part of the member of the National Metal Trades Association to the chairman of the district in which he is located; and by the employee or employees to such representatives as he or they may select, who shall by all means in his or their power endeavor to adjust the difficulty to the satisfaction of both parties. Should this committee fail to make such adjustment, then either party shall have the right to ask for a conference between the presidents of the two associations or their representatives. In the event of their being unable to adjust the differences satisfactorily, then it shall be referred to arbitration, as provided in the agreement of May 18, 1900. The findings of this arbitration by a majority vote shall be considered final as regards the case at issue. Pending adjudication by arbitration there shall be no cessation of work at the instance of either party to the dispute."

Despite this resolution, President O'Connell of the Machinists' Union at a meeting held in New York on May 11, demanded that the Administrative Council of the Metal Trades Association handle the wage question for their members then and there. This, of course, was refused, and Mr. O'Connell immediately called out the machinists throughout the country.

Several attempts have been made by the employers

to settle the matter, but each time the union assumes the same stand as taken by their president on May 11. The line on which the Metal Trades Association is now working is to show the machinists that they were led out after their agreement had been broken and to induce the men to return to work until the wage question has been properly arbitrated on the lines of the resolution of November 16, 1900. With this object in view arrangements are being made to circulate copies of the agreement and the resolution among the machinists.

The members of the Metal Trades Association who are holding out against the men claim that they are not fighting the demand for more pay, but are simply desirous of having the men know that when they sign a compact they must live up to it. The fight, they say, now is to have the men come around and stand true to the action of their officers.

Many of the employers who refuse to give in are looking ahead to a day which they say their fellow members who have acceded have probably overlooked. Next July there will be a general conference at Indianapolis of all of the trades unions of the allied metal trades for the purpose of amalgamation. They argue that the action of the machinists is simply a forerunner of what is to follow. If they accede to the demands of the machinists they will also be called upon to bestow similar benefits upon their molders, pattern makers, buffers and polishers, and in fact all of their employees. This, they argue, is the time to make the strong stand.

President Reynolds of the National Metal Trades Association is arranging for a special meeting of the administrative council to consider the action to be taken by the association nationally. It is probable that the meeting will be held in Chicago next Tuesday.

In the meantime the various district committees are holding meetings and endeavoring to arrange conferences with the union agitators with an endeavor to settle the strike locally. Thus far nothing has come of any of these meetings which has tended to alleviate the difficulty.

There was a meeting of the Second District, which comprises New York and New Jersey, on Tuesday, at which it was decided to attempt to arrange a meeting with the New York representatives of the union.

#### **The Claims of the Machinists.**

WASHINGTON, D. C., May 21, 1901.—President O'Connell of the International Association of Machinists stated to the correspondent of *The Iron Age* to-night that, according to advices received up to a late hour, about 40,000 machinists had gone out under the strike order issued last week, to take effect on May 20. Of the 75,000 men affected by the order about 30,000 had secured the desired concessions from their employers since the notice of the strike was first issued, and probably 5000 were still at work pending the negotiations now on foot with employers. In speaking of the situation, Mr. O'Connell said:

"The developments have happened along anticipated lines, and I think fully confirm our predictions. I ventured the assertion in advance that 25 per cent. of our men would receive the concessions asked in advance of the date set for the strike, and the fact shows that the figure is nearer 40 per cent. The prospect that the strike will last but a short time continues to improve, and as an illustration I have just received a telegram announcing that District No. 2 of the National Metal Trades Association, which includes the employers of New York and vicinity, desires to meet the officers of District No. 15 of the Machinists' Association. This means that negotiations are on foot looking to a satisfactory adjustment that would cover Greater New York and the neighboring towns, and would entirely eliminate the metropolis from the strike situation. In this connection I would say that while we have opposed the arbitration of the wage question in each town throughout the country, we would have no objection if it should be taken up in each one of the 15 districts covered by the Metal Trades Association. Our only objection to local treatment of these important questions is the delay that would ensue and the inability of the officers of the ma-

chinists' local organizations to secure information with which to meet the contentions of their employers with regard to conditions at competitive points.

"I am confident that the concessions which we have asked will be very generally granted in a short time, not only because our request is reasonable, but because I believe the best informed employers who have examined carefully into the matter are satisfied that there will be no material decrease in the output as the result of the shortening of the hours. The strongest point made against reducing the length of the day has been that the earning power of the capital invested would be diminished, as the same fixed charges would have to be distributed over a smaller output. It is possible that in the case of certain classes of machinery the product per man will be somewhat less, but taking it straight through the plant there will be very little difference, and there will certainly be a very important saving in power and light, for it is a well-known fact that many plants run a shorter day in winter to save light and heat. I do not think it will be practicable to increase the speed of machine tools generally, for I believe that the maximum of speed has already been reached, but undoubtedly improved tools will continue to be developed, increasing the average output per man. In this connection I calculate that employers have secured an advantage of at least 25 per cent. in the past ten years growing out of the introduction of improved machinery, the increase in the skill of the average mechanic, in the specialization of work by which men skilled only in the handling of a single machine have been trained to produce a maximum of output, and in the reductions made in wages since 1893. I do not think there is any force in the suggestion that England's machinery trade was driven to the United States by the eight-hour strikes, and that the Machinists' Association will now drive it back. Every experienced employer knows that the output of the American machinist is 30 to 50 per cent. greater than that of the Englishman, especially in the running of machine tools. I should not feel so confident of winning if it were not for the fact that I think the majority of employers are satisfied that in the long run they will lose nothing by conceding our demands."

It was stated at the headquarters of the association to-day that practically all the trouble between Kansas City and the Pacific Coast had been adjusted. In Kansas City about 600 men are out, but several firms have signed the agreements. About 6000 men have struck in San Francisco, but agreements have been reached with 11 firms. At Seattle 700 have struck, and 500 men are out at Tacoma, Wash. Very little trouble has been experienced in Chicago, and President O'Connell's reports are to the effect that all but a few small shops have reached an understanding with their men. In Boston the situation is not satisfactory, more than 2000 men being out. In Cincinnati 3000 are out, and in Alliance there are 500 strikers. In Cleveland and Columbus a general settlement has been reached. In Philadelphia 2500 men are out, but agreements have been reached with about half the employers. The reports from the South indicate that negotiations are pending in almost all the cities where any considerable number of men have struck.

The officers of the International Machinists' Association have made public the following address:

#### **AN ADDRESS TO THE MACHINISTS.**

"To the Machinists' Craft, Greeting:

"From time immemorial the great goal to which united labor has struggled, and to which it has given its best effort, has been in the direction of a shorter working day. In the majority of crafts, both skilled and the so-called unskilled, this effort has been uniformly successful, and they have for a number of years enjoyed the pleasures that come with greater leisure. Machinists, owing to the fact of their isolation in the past from the labor movement, have not enjoyed this right and privilege until now, after a decade of education, they have concluded that the time has arrived when they, too, should share in the same enjoyments. In reaching this conclusion and in seeking similar favors they know they



are not stretching their demands beyond the bounds of reason or seeking something to which they have no valid claim.

"More than a quarter of a century ago our brother craftsmen in Great Britain secured a nine-hour day, and it is conceded by all manufacturing machinists who have given the question the least study that the American machinist produces more per diem, even on an eight-hour basis, than does his brother craftsman in that country. Such being the case it is eminently proper and strictly in accord with the spirit of the times that the machinists of the United States, Canada, and Mexico should make a concerted movement in the same direction. The time has come, the moment is ripe, and the demand is now made.

"To the uninformed a few words explanatory of the position the machinist occupies in the domain of productive labor and in connection with a shorter workday may not be out of place. Owing to the peculiar nature of our trade and the great inroads into it by the introduction of more perfect machinery, a great deal more is now produced than ever. This increase in machinery continues with the succeeding years, but in spite of this no material or permanent increase in wages has been secured by the man who manipulates the machine. He produces more, but receives no more than he did formerly. Now the demand is made for a fairer share of what we produce by shortening the work day by one hour without any decrease in pay.

"This demand is not made without due warning. Twelve months ago notice was served on the manufacturers of the United States that on Monday, May 20, 1901, the International Association of Machinists would demand a nine-hour day, and that if the demand was not granted its members and those in sympathy with them would suspend labor until the demand was granted.

"We appeal to our fellow craftsmen to rally with us mistakes of the past, but merely a peaceful cessation of labor until we can start work on a nine-hour day basis.

"We appeal to our fellow-craftsmen to rally with us in this effort to elevate our manhood; to improve our minds; to purify our bodies and our lives; to make of us exemplary citizens; to make our homes more homelike with our presence, and to show the world that we, too, have aspirations a 'little higher than the brutes and scarcely lower than the angels.' Signed by James O'Connell, president; D. Douglas Wilson, vice-president, and George Preston, secretary-treasurer of the International Association of Machinists; Hugh Doran, Arthur W. Holmes, John J. Connolly, and P. J. Conlon, general Board of Trustees."

#### FIRST DISTRICT.

##### New England States.

###### MEMBERS NATIONAL METAL TRADES ASSOCIATION.

American Tool & Machine Co.	Driggs-Seabury Gun & Ammu-
Barbour-Stockwell Co.	nition Co.
Deane Steam Pump Co.	Eaton, Cole & Burnham Co.
Farrel Foundry & Machine Co.	Holmes & Blanchard Co.
Holyoke Machine Co.	Bausch Machine Tool Co.
Birmingham Iron Foundry Co.	Atlantic Works.
Geo. F. Blake Mfg. Co.	

A consideration of the following letters which we have received shows that the strike of the machinists in the New England district is by no means colossal in its proportions. A remarkably small percentage of the metal working concerns is affected. A strike cannot be classed as very widespread when prominent concerns only know of trouble by reading newspaper dispatches from outside localities. Worcester, Providence, Hartford and the Naugatuck Valley are as yet practically undisturbed.

##### Worcester.

Prentice Bros. Company of Worcester say: "We are not members of any Metal Trades Association. As our men have made no demand on us, we, therefore, have of course found it unnecessary to make them any counter offer. Rather than accede to the demands we see the machinists have made in other cities, our works would be closed. Our plant is now running full time."

The Norton Emery Wheel Company of Worcester state that "no demands whatever have been made upon us; therefore we have not considered the matter."

The Morgan Spring Company of Worcester: "In reply would say that we do not belong to the Metal Trades Association, and up to the present time do not find that the machinists' strike affects us at all."

The Morgan Construction Company of Worcester reply as follows: "We are not a member of the Metal Trades Association. Have made no counter offer to our men, but several weeks ago voluntarily adopted 58 hours as a full week's work, without making any change in the weekly pay. No demands were made by our men. Plant is in full operation."

Wyman & Gordon of Worcester do not belong to the association and have not been asked to reduce their ten-hour day to nine hours. Their plant is running to its fullest capacity.

The Woodward & Powell Planer Company of Worcester say: "We are not a member of the Metal Trades Association. We have not made any counter offer to our men. We do not anticipate that our men will make any demands, as we work for each other's interest. Our plant is not idle."

Harrington & Richardson Arms Company of Worcester are not members of the association, have made no offer to their men, and are running full time.

##### Massachusetts.

The Becker-Brainard Milling Machine Company of Hyde Park, Mass., do not belong to the association, have made no offer to their men and are running full handed.

H. C. Fish Machine Works: "Are not members of the association, nor do we know anything about the strike in question except what we have read in the papers, and we have sufficient confidence in the men whom we employ to believe that that is all that we ever will know about it. In reply to your last question will say that we are now running full time and full force."

The Goddard Machine Company of Holyoke are not members of the association. They have made no offer to their men, as they have made no move yet toward the nine-hour day. If the demand is made and refused, it will cause the shutting down of the shop entirely. Their plant is running.

The Automatic Machine Company of Greenfield say that "as yet we have had no issue with our men regarding a shorter hour for a day's work, they having made no demand for such, and we have made no proposition to them."

The Wiley & Russell Mfg. Company of Greenfield say that the trouble has not extended to that place.

The Goodell-Pratt Company of Greenfield report as follows: "We are not a member of the association. We have had no demands made upon us, consequently counter offers are superfluous. We have very few regular machinists employed. Our plant is running full time and we do not anticipate any trouble because of the agitation which is in vogue in other localities. Our men are well paid and regularly employed. They are a high order of citizens and they would be loath to ask of us what it would not be possible for us to grant."

L. S. Heald & Son of Barre, Mass., state that "we are not members of the association. We have not made any counter offer to the men, for the reason that the matter has not been brought up by them—that is, we have received no demands; and, in fact, no mention whatever has been made of the matter. We do not anticipate any question to arise in regard to this matter, and our business is progressing exactly as usual, the only difficulty being that we find our orders come in faster than our present force of help are able to get out the work."

The B. F. Sturtevant Company of Boston, Mass., state that their plant is in full operation.

The Fitchburg Machine Works of Fitchburg, Mass., are not members of the association, and no demand has been received from their men in any way.

The L. S. Starrett Company of Athol, Mass., in a circular to their employees, dated the 21st, said: "Our business is and has been steadily increasing in volume and importance, and we now take pleasure in sharing with you the prosperity which you and we together have earned. Beginning the first day of June next nine hours a day or 54 hours per week, instead of 60 as at present, will be the rule in this factory, without reduction in pay. During June, July and August work will continue ten hours per day (7-12, 1-6), on the first four days of the week; on Fridays work will stop at 5 p.m., and on Saturdays at 12 m., thus allowing the whole afternoon as a holiday."

##### Providence.

The American Screw Company of Providence, R. I., reply as follows: "We have to say that this movement here in Providence began on Monday, May 20, by the machinists not reporting for work at two of the leading establishments, and the policy of the union seems to be to make a test case of them, and not to molest the other employers, of whom there are something like 20 in Providence and vicinity, until the first two test cases

are defined. We are not members of the Metal Trades Association, and there has been no communication with or from our men on this matter, all of whom are contented with the existing arrangements with us, so far as we have any knowledge. We have no present intention of acceding to the demands of any of our men, if of such a nature as to interfere with the management of our business, and in this instance it is too early to say what effect the continuance of our policy may have. Our plant is fully occupied."

The Rhode Island Tool Company of Providence are not members of the association; have made no offers to their men; are running full handed, and a strike of this kind would not affect them seriously, as they employ only a few machinists on special work.

The Brown & Sharpe Mfg. Company of Providence have had no trouble, and anticipate none. They are not members of the association.

The Geo. H. Corliss Steam Engine Works of Providence are closed.

The Providence Engineering Works have shut down. The Potter & Johnston Company of Pawtucket, R. I., "would say that we only know there is a machinists' strike on through the newspapers; it has in no way affected us."

#### Connecticut.

The Waterbury Farrel Foundry & Machine Company of Waterbury, Conn., are not members of the association. A failure to accede to the machinists' demands would stop their business for a time. Their plant is idle, so far as the machine business is concerned. Talking to his men last Monday morning, W. E. Fulton, the manager, said: "It will be impossible for this factory to become a union shop."

"Your committee called on me for the first time last Friday, May 17. I think it would have been well if they had called a few weeks ago, so we might have talked the matter over fully. If that had been done I doubt if three-fourths of this shop would have joined the union. If the apprentices join the union they break their agreement with us, and we will hold the parent or guardian responsible."

"Our employees admit that they have no grievances, and all the trouble that exists is that they are members of a union, which compels them to strike on May 20, 1901, unless the employers sign the agreement. We are honest in saying we cannot conscientiously sign, and we assure you that our answer is in no degree for the purpose of oppressing you. Personally (I do not speak officially in saying this) I am advocating time and a quarter for any work after 5 o'clock and until 9 o'clock; after 9 o'clock time and a half or more, and this to be subject to special agreement, for it is of rare occurrence to want to run later than 6 o'clock, and very seldom that there is any need of running the shop until 9 o'clock. In case we can secure orders sufficient to run the shop until 6 o'clock you would receive 10¼ hours per day."

"Regarding apprentices. We do not object to changing from three years, as at present, to four years' term of apprenticeship, but we do object to your dictating that a foreman may not have the privilege of hiring whatever number of apprentices he chooses to place under apprenticeship. We never solicit apprentices, but there are more applications from boys wanting to learn the trade than we can place at work advantageously."

The Cross & Speirs Machine Company of Waterbury are not members of the association. They say: "We have made no offer whatever to our men. The outlook is that it will cripple us very much, although we hope and expect to run right along with a small force. Our plant is not idle at the present time, although we have less than 15 per cent. of our force at work. The outlook is not promising for two or three weeks ahead at least."

The Hendey Machine Company of Torrington, Conn., do not belong to the association. No demands have been made upon them, and up to the present time their men are all working and they do not anticipate any trouble. "As you know, the machinists in Connecticut are very much stirred up at the present time, and if it continues it may lead to serious trouble; but we anticipate that it will be over in a short time and the men will go back to their regular work."

The Union Hardware Company of Torrington do not belong to the association and have made no offers to their men. A strike would only affect them slightly. "We employ about 20 tool makers. Have brought half of them up; they have no complaints and we anticipate no trouble. We are sure of enough to set tools, keep up ordinary repairs and run, but might be troubled on new goods or new work."

The Norwalk Iron Works Company of South Norwalk, Conn., are not members of the association and have made no overtures to their men. "We have been running our entire works for some time 58 hours per week and crediting for full attendance 60 hours on the pay-roll. We do

not believe any considerable number of men will leave our employment. Our plant is running full time and full handed."

#### New Haven.

From J. B. Sargent, president of Sargent & Co. of New Haven, we have received the following letter:

"In reply to your letter of inquiry of yesterday, we have to say that ten years ago, more or less, but we think more, we voluntarily, without even inquiring of our factory force whether the change would be agreeable to them, changed our working day from ten hours to nine hours. We thought, and still think, the change good manufacturing policy."

"We believed and still believe that a good and honest workman, if willing, can accomplish as much in days of nine hours as in days of ten hours, and with less weariness, and will do better work."

"We pay in our machine shops by the hour. To those machinists who entirely liked our plan we paid sufficient to make their nine hours' pay equal to the ten hours' pay of machinists of similar grade in the ten-hour shops; so that May 20, 1901, found all our manufacturing force with ten hours' pay for nine hours' work."

"So there is no difference between our machinists and ourselves on the nine-hour day question nor on the pay question, but we understand that the national union of machinists requests us to sign some contract relating to arbitrating between ourselves and machinists. But as we have never, in 50 years' experience, had even one unpleasant word between ourselves and our machinists or other employees, we do not think it necessary to provide a bridge over any fancied disagreements that probably will never appear. We always have paid, and intend to continue to pay, full current wages, according to skill and ability."

The National Pipe Bending Company of New Haven say they are not bothered with any strike.

The New Haven Mfg. Company of New Haven are not members, have made no counter offer to their men and are operating their plant as usual.

Miner & Peck Mfg. Company of New Haven do not belong to the association, have made no proposition to their men and are very busy. They say: "We employ mostly skilled American machinists, or, as we call them, 'Yankee' machinists, and they do not care for unions, and there are so many of this class of men in this section that there will be little trouble with this movement. It is only the unskilled men that are union men."

The Eastern Machinery Company of New Haven say: "Replying to your inquiry of May 20, would say that we are not members of the Metal Trades Association. We have not made a counter offer of any kind to our men. About 30 per cent of our force signed a request last Saturday for ten hours' pay for nine hours' service, which was not acceded to. Everything is running now as usual, however, and only one man has disappeared. We might be willing to operate our factory on nine hours' time, paying the same rate per hour that we do now, but no suggestion of that kind has been proposed."

#### Hartford.

The Colt's Patent Fire Arms & Mfg. Company of Hartford are running on full time and with a full force of men.

The Billings & Spencer Company of Hartford are not members and have made no offer to their men. "If we do not accede to the machinists' demands the effect it will have upon our works is problematical. Our plant is now running full and none of the employees are absent."

The Farrel Foundry & Machine Company of Ansonia, Conn., say: "We proposed arbitration and agreed that the findings of the Board of Arbitration should date from May 20. When our men rejected this we suggested that if they made us an offer to compromise on the basis of 57 hours' pay for 54 hours' work, and a straight 5 per cent. advance for piece workers, we would give it careful consideration. They did not follow our suggestion. If we do not accede to the machinists' demand it will close all departments with the exception of the foundry. Our plant is practically idle with the exception of the foundry."

#### Bridgeport.

Curtis & Curtis Company of Bridgeport, Conn., state: "We are not members of the Metal Trades Association, and there are very few members of this association in this vicinity. We have not made any counter offer to our machinists. We have not nor do we expect to accede to the machinists' demands. We have a few men out, but our works are running."

At the Bullard Machine Tool Company, Bridgeport, the men have gone out.

The Wilmot & Hobbs Mfg. Company of Bridgeport say: "We are not members and do not want to be, as we understand it does not benefit its members. We have



made no offer and do not intend to. Plant is running as usual, except on new work, which we prefer to let stand rather than be dictated to by unions. If labor is going to try to get in its hand on dictating as to our management we prefer to shut down indefinitely, believing that we will lose less in that way than by being subjected to interferences from outside sources."

Harvey Hubbell of Bridgeport is not a member, his plant is not idle and he has made no offer to his men.

#### Vermont.

Jones & Lamson Machine Company, Springfield, Vt., say: "We are not members of the association. We have never received a request for shorter hours or increase of pay from our men as a body. For a number of years we have paid for 57½ hours for 55 hours' work during the summer months, and this year we are paying for 60 hours, while the men work 54 hours per week. We are running with a full number of hands."

Fellows Gear Shaper Company, Springfield, Vt., say that they are not members of the association, and their works will not be affected by refusing demands of the machinists. Their plant is in operation.

### SECOND DISTRICT.

#### New York and New Jersey.

##### MEMBERS NATIONAL METAL TRADES ASSOCIATION.

E. W. Bliss Co.	Watson Machine Co.
Cooke Locomotive & Machine Co.	Seneca Falls Mfg. Co.
Benjamin Eastwood Co.	Buffalo Pitts Co.
W. & A. Fletcher Co.	Otis Elevator Co.
Garvin Machine Co.	McIntosh, Seymour & Co.
Holly Mfg. Co.	Samuel L. Moore & Sons Co.
Hewes & Phillips Iron Works.	Krajewski-Pesant Co.
Iroquois Iron Works.	Niagara Machine & Tool Works.
Lidgerwood Mfg. Co.	James Reilly Repair & Supply Co.
Manning, Maxwell & Moore.	American Fire Engine Co.
Payne Company.	Gleason Tool Co.
Quintard Iron Works.	A. & F. Brown Co.
John Royle & Sons.	General Incandescent Arc Light Co.
Snow Steam Pump Works.	Knowlton & Beach.
A. B. See Mfg. Co.	Marine Engine & Machine Co.
Watson-Stillman Co.	
Watts-Campbell Co.	
Henry R. Worthington.	

New York and New Jersey are in an unsettled state. Instances where the demands of the men have been granted have goaded other machinists on to strike, whether they are members of the union or not. A few of the larger concerns have given in and many smaller ones have followed suit. On the other hand, several of the most important manufacturers in this section are holding out firmly, some awaiting the action of the Administrative Council of the National Metal Trades Association. This evening (Wednesday) there will be a meeting of three delegates of the Metal Trades Association and a similar number of the union's "business agents." It will be held at the Astor House. N. B. Payne of the Payne Engineering Company of New York City, William Schwanhauser of the Henry R. Worthington branch of the International Steam Pump Company and George H. Phillips of the Hewes & Phillips Iron Works of Newark, N. J., will represent the Metal Trades Association.

#### New York.

In New York City the greatest disturbance is at the works of R. Hoe & Co. The entire force of men are striking. The company are willing to grant the demands of the men provided they will agree to the abrogation of an agreement formulated three years ago between the company and the local union, to the effect that none but union machinists will be engaged. This the men are unwilling to do.

The union machinists of the Garvin Machine Company are among the strikers.

The H. R. Worthington works of the International Steam Pump Company are crippled. The men went out on Monday, but returned to work on Tuesday on the strength of a promise that the directors of the company would grant the demands as soon as they could be gotten together. The directors were given until Tuesday evening to grant the demands and as they failed to do so the men went out again on Wednesday.

F. H. Stillman, president of the Watson-Stillman Company, says: "I am a member of the National Metal Trades Association. In common with many others I have had no request for change of time or wages made to me; in fact, I have never had but one communication with the trades union relative to shop conditions, and in that they backed down. I notified my men a long time ago that I expected to raise the wages, and same has

been done, and my entire shop is at work at 54 hours per week."

The E. W. Bliss Company of Brooklyn have settled the question and the shop is running as usual.

The Lidgerwood Mfg. Company of Brooklyn have acceded to the demands and are now running full.

At the Adriaance Machine Works of Brooklyn it is stated: "We have been running our works for the past year on 55 hours a week, and when the question of the nine-hour day came up we acceded to the request of our men for a 54-hour week, and at the same time we made an amicable settlement with regard to the rate of wage. We have had no complaints of any kind and our men all seem to be perfectly satisfied and happy under the present arrangement. We have made division of the 54-hour week in the following manner: Working nine hours a day on Monday, beginning at 8 a.m.; ten hours every other day in the week except Saturday, when we work five hours, closing at 12 m."

William C. Redfield, treasurer of J. H. Williams & Co., informs us that "on January 2 last, after careful consultation with our workmen, we advised them that on March 1 the works would be put on a nine-hour basis with ten hours' pay. This was voluntarily done, unasked, and has been cordially received by our working force. It went into effect on March 1 and has been advantageous both to our workmen and to ourselves. It has not been a loss, but a gain; our output is, if anything, slightly larger than before. This is clearly shown by accurate records where such records are available and satisfactorily so where details cannot be had."

#### New York.

The Coldwell Lawn Mower Company of Newburgh, N. Y., inform us that their men have made no demands and the shop is running as usual.

The General Electric Company have made concessions to their men at Schenectady and the shops are now in operation unaffected.

At Seneca Falls the machinists are out in force. All of the principal shops are crippled by the strike, and we have not heard of any settlements as yet. The Seneca Falls Mfg. Company inform us that "We are members of the Metal Trades Association, and have made no counter offer to our men and have none in contemplation. Our machine shop is practically idle."

The Goulds Mfg. Company of Seneca Falls, state that no concessions have been made to their men, and in consequence the plant is idle, as it has been shut down by the union. About 500 men are laid off.

The machinists of the American Fire Engine Company of Seneca Falls are also out.

The Bradley Company of Syracuse state that no demands have been made by their machinists and their plant is running full time, 55 hours per week.

The Gleason Tool Company of Rochester, N. Y., are victims of the strike, as the men have all gone out, and no settlement has been made.

#### New Jersey.

At Newark, N. J., the shops of two of the large Corliss engine builders and a number of smaller machine shops are affected. The Hughes & Phillips Iron Works Company, and the Watts Campbell Company are the engine builders referred to. Both of these concerns are members of the National Metal Trades Association, and while at the former works the apprentices were kept at work under the nine hour schedule with ten hours' pay, neither of the shops has shown any disposition to grant the demands of the men. The Turner Machine Company, who operate the Yule & Carley Hat Machinery Company, have refused to grant the demands of the men, and the works are practically closed. The employees at the works of Gould & Eberhardt have not asked for a shorter day or more pay, and the works are running 55 hours per week.

The Marine Engine & Machine Company of Harrison, New Jersey, have recently become affiliated with the National Metal Trades Association, and the men are on strike. The machinists employed by the Crocker-Wheeler Electric Company of Ampere, N. J., went on strike Monday morning and took with them all the rest of the employees of the shop, numbering more than 400. The company informed the men that they were willing to go half way and give them 10 hours' pay for 9½ hours' work, but this the men refused. Consequently a notice was posted on Monday to the effect that if the men wished to return to work under the company's conditions they must do so before 5.30 o'clock, and if not they should secure their tools and personal effects and leave the employ of the company, as the works would be shut down indefinitely. The men did not comply with this request, and the works are now closed.

The Lambert Hoisting Engine Company of Newark, N. J., have granted the demand of the men. J. S. Mundy have also acceded to the demand.

The Newark plant of the Westinghouse Electric &

Mfg. Company was not affected, as the men are working nine hours per day on the piece work system.

There were no demands made by the employees of the Western Electrical Instrument Company of Waverly, N. J.

Practically all the departments of all the shops at Plainfield, N. J., have closed. These are the Pond Machine Tool Works, the Potter Press Works, the Scott Printing Machine Works and the Aluminum Plate & Press Company. From 1500 to 2000 men are idle. At Pond's an arrangement was made by which they had until June 3 before stating their position. This created dissension in the union, and the time was changed to May 24. On Monday night this date also was decided to be too far off, and the local branch of the Machinists' Association issued the order enjoining the workmen in the Pond shops to live up to their obligations to the union. For this reason the strike spread to the tool works on Tuesday. Mr. Scott of the Scott Printing Machine Works said that he was debating the advisability of closing the entire plant at the end of this week. "As far as the management is concerned," he said, "no concern is felt." The men have taken their own stand and the settlement does not rest in his hands. "I'm thinking of taking a vacation," he said, "I might close up the place and go away for a month or so. No; there is no likelihood of the manufacturers coming together. We are all satisfied to let the thing rest for the present."

The report that the manufacturers would meet in conference is without foundation. They do not see any necessity for such a step.

The Hall Switch & Signal Company at Garwood, N. J., are not affected by the strike, as the shop has never been considered a union one.

At the C. & C. Electrical Works, Garwood, N. J., every thing is running as usual.

A press dispatch from Trenton, N. J., states that the John A. Roebling Sons Company, the New Jersey Wire Cloth Company and the Reeves Machine Company have granted the demands.

The Eagle Anvil Works of Trenton, N. J., do not belong to the association, and no demands have been made of them. They say: "Have not been idle since 1849. No union men ever employed by us."

The Cooke Locomotive & Machine Works of Paterson have had no demands from their men, except for a half holiday during the summer. They are running as usual.

The John M. Rogers Boat, Gauge & Drill Works, Gloucester, N. J., are not affected, as they have no union men in their employ.

At Perth Amboy, N. J., all the firms have conceded the demands of the machinists, who have all returned to work.

The men have struck at the car works of the Delaware, Lackawanna & Western Railroad at Hoboken and Secaucus, N. J. The men at the repair shops of the Central Railroad of New Jersey have also struck.

The John H. Dialogue Ship Building Company, Camden, N. J., offered the men the nine-hour day at nine-hour pay, but they refused it and struck. The plant was shut down.

At the New York Ship Building Company, Camden, N. J., most of the machinists have struck.

### THIRD DISTRICT.

Pennsylvania, Delaware, Maryland and District of Columbia.

#### MEMBERS NATIONAL METAL TRADES ASSOCIATION.

Erie City Iron Works.	A. Falkenau.
William Sellers & Co., Inc.	Flynn & Emrich.
Geo. V. Cresson Co.	Dickson Mfg. Co.
Riehle Bros. Testing Machine Co.	Tabor Mfg. Co.
	Wilbraham Baker Blower Co.

#### The Situation in Philadelphia.

PHILADELPHIA, PA., May 21, 1901.—The strike of the International Association of Machinists has probably not caused as much inconvenience in this city as was generally anticipated. The larger manufacturers, such as the Baldwin Locomotive Works and the Midvale Steel Works, have been entirely unaffected, and the William Cramp Ship & Engine Building Company are practically so, and many of the smaller manufacturers have had no difficulty with their men whatever. A number of plants have for a long time been working on a 54, 55 or 56 hour per week basis, and at a wage scale that has been satisfactory to the men, therefore no demands were made upon them. Other manufacturers have since Monday morning agreed to the demands of the men, and they have returned to work, while others are feeling the partial effect of the strike and a few plants have been tied up and are temporarily closed.

Fourteen machinists are on strike at the works of the American Pulley Company; concessions of nine hours per day had been granted these men before any demands had been made by them, but in addition to this they ask for ten hours' pay. The operation of the plant has not been seriously affected.

The Link-Belt Engineering Company have long had a satisfactory arrangement with their men, and no demands whatever have been made upon them.

At the Barr Pumping Engine Works 25 machinists are out. This company made a counter proposition to the men, agreeing that, if the demands of the men were acceded to by the larger manufacturers, the Barr Pumping Engine Company would also grant their demands. This proposition the men refused to accept. The works are running as usual, and it is said that as men are required the positions of those now out will be filled.

The Southwark Foundry & Machine Company report that they have had no difficulty with their men, and none is expected.

The Harrison Safety Boiler Works have had an agreement with their men, who still remain at work, to await developments of the machinists' demands in other shops and to be governed thereby in their actions. Twenty machinists are employed by this company.

At the plant of the Moore & White Company, 30 of the 90 machinists employed by them have gone out. This company on May 1 established without any demand on the part of the men a wage scale of 56¼ hours' work with 60 hours' pay. This, however, was not deemed satisfactory by the men, and the demand was made for 54 hours' work with 60 hours' pay. This the Moore & White Company refused to grant. No serious difficulty is being experienced in operating the plant and new men will be employed as required.

Forty-nine men went out at the plant of the Pedrick & Ayer Company, and as no satisfactory agreement has been reached, the plant has been shut down for an indefinite period.

Among others who have had no difficulties with their men and whose plants are being operated uninterruptedly may be mentioned:

The Neafie & Levy Ship & Engine Building Company.  
The Philadelphia Roll & Machine Company.

I. H. Johnson, Jr., & Co.

Thomas H. Dallet & Co.

Dienelt & Eisenhardt.

F. H. Gleim & Co., 15 men; Philadelphia Machine Tool Company, 20 men; Electro-Dynamic Company, 70 men, are among those who have granted the demands of the machinists and whose plants are now in operation.

#### Philadelphia.

Bement, Miles & Co., Philadelphia, Pa., say: "We do not belong to the association. The settlement of discussion which we have had with our men has been postponed until June 3. Our plant is now running full."

Baldwin Locomotive Works, Philadelphia, say: "We are not a member of the association. As our men are working as usual, we have not made any counter offer to them. Our works are not affected and are running as usual."

R. D. Wood & Co., Philadelphia, say: "When our men brought the question before us at our works we with pleasure talked with them on broad, fair lines, which they thoroughly appreciated, and are keeping steadily at work feeling that we will treat them properly. If a kindly discussion of the same sort is held by every manufacturer in the country the thing would pass off and take a reasonable shape."

The William Cramp & Sons Ship & Engine Building Company, Philadelphia, say that they are not members of the association and that their plant is very busy.

The Otto Gas Engine Works, Philadelphia, say that they are running as usual and have heard nothing about a strike except what they have read in sensational reports published in the newspapers.

Philadelphia Pneumatic Tool Company, Philadelphia, say that they have been running on a nine-hour basis for nearly a year now in their machine shop, and the present strike among machinists does not affect them in any way.

Newton Machine Tool Works, Philadelphia, say: "We are not members of the association. We are having no trouble whatever with our men, nor do we an-



ticipate any. Our plant is running the same as usual, with our full force of men."

The Tabor Mfg. Company, Philadelphia, state: "We are members of the association. We have made no counter offer to our men, except that we are willing to work only one-half day on Saturdays, thus making 57½ hours per week. All our machinists but one are now on strike. Our plant is not idle, as we have some apprentices, a foreman and two machinists (one who came in after the others went out) at work. We have no real objection to the shorter hour day, but the sticking point is the arbitrary increase in wages of 12½ per cent."

The Enterprise Mfg. Company of Pennsylvania, Philadelphia, say: "We are not members of the association. Our machinists demanded ten hours' pay for nine hours' work Monday. This we refused, and 90 per cent. left our employ. We made them no counter offer from the fact that we have been paying, from what we learn, considerable above the average pay for machinists. It may take us some little time to employ other men, but no matter how long it takes, it is our intention to conduct our own business in the future, as in the past. Our plant is now running full, but, of course, with some little inconvenience. It is not our intention to allow outsiders to dictate as to how we shall conduct our affairs, and we think it high time that every manufacturer should come to this conclusion, or we will very soon be in the position that the English manufacturer is now in, having to deal with machinists who are half their time studying as to how little work they can do and how much money they can carry off, dictating to their fellow mechanics as to what amount of work they should do, and lots of other things equally meddlesome. This is a serious question for the American manufacturer, who expects to obtain foreign trade in competition with Germany, whose mechanics have and are receiving thorough technical training, and in many instances working 12 hours a day at not over 50 per cent. of the wages that the American mechanics are receiving for ten hours' work. This the writer knows from experience. In our own case we have always endeavored to study the interests of our employees, spending thousands of dollars for their benefit. Referring particularly to the hours of work, for 14 years it has been our custom to operate our plant 57½ hours each week, and to all employees making full time, we paid for 60 hours, thus giving a bonus of 2¼ hours in each week, for regularity and punctuality, and besides a Saturday half holiday all the year round, which we thought was thoroughly appreciated by all our employees."

The Midvale Steel Works, Philadelphia, according to press reports, are not disturbed.

Hoopes & Townsend, Philadelphia, are also reported not disturbed.

Reilly & Farnum, Philadelphia, are reported to have 10 men out.

Williamson Bros., Philadelphia, are said to have 50 men out.

Thomas C. Dill, Philadelphia, are reported to have 34 men out.

Edco Electro-Dynamic Company, Philadelphia, have 25 men out, according to press reports.

American Pulley Company, Philadelphia, are said to have six men out.

Pennsylvania Iron Works and Globe Gas Engine Company, Philadelphia, are reported closed.

Moore & White Company, Philadelphia, are reported to have half their machinists out.

Wilbraham Machine Company, Philadelphia, are reported to have 10 men out.

Leever & Grundy, Philadelphia, are said to have 30 men out.

Butterworth & Sons, Philadelphia, are reported to have 300 men and boys, including machinists, out.

Scott and Williams, Philadelphia, seven men are reported out.

The Allen Implement Company, Philadelphia, are reported to have asked their 60 men to defer action until Thursday.

Eynon & Evans, Philadelphia, are reported to have promised their 15 machinists that if the majority of other firms sign the union agreement they will also sign, and will pay for all overtime from May 20.

Lucas & Gleim, Philadelphia, are said to have signed Tuesday, and their 50 machinists have returned to work.

Hess & Barker, Philadelphia, are reported to have signed.

Lindsay & Hyde, Philadelphia, are reported to have been served with notice that unless they grant the union's demands by Wednesday their machinists will strike.

#### Pittsburgh.

The strike inaugurated in nearly all parts of the country on Monday, May 20, by the members of the Interna-

tional Association of Machinists will affect the Pittsburgh district very little. It is said that there are about 2100 members of the Machinists' Association in Pittsburgh, and of this number only about 100 have struck, the employers of the other 2000 signing the scale. It is expected that the six concerns who so far have not signed the agreement will do so in a few days, and when this is done the 54-hour per week rule will prevail in all the machine shops in the Pittsburgh district.

Frank-Kneeland Machine Company, Pittsburgh, Pa., say: "We are not members of the association. Inasmuch as we have always worked under the nine-hour day, there have been no demands made upon us of any nature, consequently our plant is not idle."

The Oil Well Supply Company, Pittsburgh, are reported to have signed the scale.

Heyl & Patterson, Pittsburgh, are said to have refused to sign the scale.

Oliver Iron & Steel Company, Pittsburgh, are reported to have also refused to sign the scale.

Pittsburgh Shafting Company, Pittsburgh, are reported to have refused the demands of the machinists.

American Steel & Wire Company, Pittsburgh, are reported to have signed the scale.

Forrest Oil Company, Pittsburgh, are said to have many men out.

Pressed Steel Car Company, Pittsburgh, are reported to have their men out.

#### Pennsylvania.

Pennsylvania Engineering Works, New Castle, Pa., say: "We are not members of the association. We made a compromise agreement with our machinists. All departments are in operation except the plate shop."

Vulcan Foundry & Machine Company, New Castle, Pa., are not members of the association, and have made an agreement with their men on the nine-hour day with ten-hour pay basis. The plant is in operation.

Central Railroad of New Jersey shops at Wilkes-Barre, Pa., are reported idle.

Lehigh Valley Railroad shops at Wilkes-Barre, Pa., are reported to be practically idle.

Dickson Mfg. Company, at Wilkes-Barre, Pa., are reported to have closed.

Hazleton Iron Works Company, Hazleton, Pa., are said to have granted the demands of the machinists and molders. The men are to work ten hours a day for the first five days and have a half holiday Saturday at full pay.

Jeanesville Iron Works, Hazleton, Pa., are reported to have granted the demands of the machinists and molders.

York Mfg. Company, York, Pa., are reported to have most of their men out.

S. Morgan Smith Company, York, Pa., are reported to have a large number of men out.

C. C. & E. P. Townsend, New Brighton, Pa., say: "We are not members of the association. We have both union and nonunion men in our employ, and nothing has been said concerning the machinists' demands for a nine-hour day with ten hours' pay by our men. We do not employ many machinists in proportion to the number of men in other lines, but if the men came to us we should probably come to an amicable agreement with them."

Lukens Iron & Steel Company, Coatesville, Pa., say: "We do not have a membership in the association. Our machinists, of whom we do not employ a great many, have not participated in the strike movement, nor have we heard that they contemplate doing so. Our plant is in active operation, and it is not at all likely that the disaffection elsewhere will have any effect on our employees."

Landis Tool Company, Waynesboro, Pa., say that they are not members of the association and their machinists have made no demands whatever upon them. Their plant is working at its full capacity. The International Association of Machinists have no organization at Waynesboro. An attempt to organize has been made, but was unsuccessful.

Press dispatches say that in the Pittsburgh district 104 firms, employing nearly 4500 machinists, have signed the scale and the men are at work.

Continental Iron Company's mill at Wheatland, Pa., are reported to have acceded to the demands of the men.

Reading Iron Company, Reading, Pa., are said to be the only concern in that city employing members of the machinists' union. They are out with the striking tube overers.

Press dispatches say that almost every machinist in Sharon, Pa., is now out. The machinists at Sharpsville and West Middlesex are also out. At Oil City the machinists are all at work, the different establishments having practically conceded all demands.

French's foundry and machine shops at Scranton, Pa., are reported idle.

Scranton Bolt & Nut Company, Scranton, Pa., are reported closed.

Delaware & Hudson Company, Simpson shops, Scranton, Pa., are said to have been closed.

Lackawanna Iron & Steel Company, Scranton, Pa., are reported to have all their machinists out. This may result in the suspension of the entire works, throwing out 1500 more men.

Every machine shop in Scranton, Pa., is reported idle. Altogether 3000 men have quit work, and these, with the Lackawanna Railroad machinists and car shop men out for a week past, make nearly 5000 on strike in Scranton.

#### Baltimore.

John B. Add, Baltimore, Md., is reported to have granted the demands of the men.

J. S. King Machine Company, Baltimore, Md., are reported to have made a special agreement with their men six weeks ago, whereby they are to work nine and one-half hours per day. The men are keeping the agreement.

Keen & Hagerty Mfg. Company are reported in full operation. Negotiations are pending.

Henry McShane Mfg. Company, Baltimore, Md., are said to be little affected by the strike; but 12 men are out.

Maryland Foundry & Machine Company, Baltimore, Md., are said to have granted the demands of the men.

Thomas C. Basshor Company, Baltimore, Md., are reported to have granted the demands of the men.

Ott, Mergenthaler Company, Locust Point, Md., are reported to have 80 men out.

White & Middleton Gas Engine Works, Baltimore, Md., are said to have 60 men out.

Sinclair-Scott Company, Baltimore, Md., have acceded to the demands of the men.

Maryland Steel Company, at Sparrow's Point, Md., are reported to have 550 men out.

F. S. & G. L. Brown, Baltimore, Md., are said to have 11 men out.

Canton Copper Works, Baltimore, Md., are reported to have 24 men out.

Baltimore Arms Company, Baltimore, Md., are said to have 24 men out.

The Detrick & Harvey Machine Company, Baltimore, Md., say: "We are not members of the association. We offered our employees a nine-hour day with ninehours' pay, pending the settlement of the demand by other machine tool builders, and we would further grant any further concession that might be made by our competitors in that line. With the exception of our pattern shop and blacksmith shop, our works are practically at a standstill."

#### Wilmington.

A. L. Henderer Company, Wilmington, Del., are reported to have signed the scale.

Jackson & Sharpe, Wilmington, Del., are reported to have signed.

Harlan & Hollingsworth Company, Wilmington, Del., are reported to have 110 men out.

J. Morton Poole Company, Wilmington, Del., are reported affected by the strike.

Remington Machine Company, Wilmington, Del., are reported to have acceded to the demands of the men, and they will return to work at once.

Trump Brothers, Wilmington, Del., are reported to have signed the scale.

Betts Machine Company, Wilmington, Del., say they are not members of the association, and that they have made no counter offer to their men, except asking for a little more time to consider. If they do not accede to the machinists' demands their works will be seriously affected until they get men to take their places. Out of 250 men in all departments about 75 are out; the rest are working as usual.

George W. Baker & Co., Wilmington, Del., are reported to have closed.

Pusey & Jones, Wilmington, Del., are said to have but few union men. They are expected, however, to grant a nine-hour day.

Hilles & Jones Company, Wilmington, Del., are said to have granted the demands of the men, and are in operation.

American Die & Tool Company, Wilmington, Del., have acceded to the demands of their men, and are in operation.

#### FOURTH DISTRICT.

##### Michigan and Ohio.

##### MEMBERS NATIONAL METAL TRADES ASSOCIATION.

Bickford Drill & Tool Co.	I. & E. Greenwald Co.
Jeffrey Mfg. Co.	Schumacher & Boye.
Laidlaw-Dunn-Gordon Co.	Lloyd Booth Co.
Leland & Faulconer Mfg. Co.	"Long-Arm" System Co.
Lodge & Shipley Machine Tool Co.	Lunkenheimer Co.
J. A. Fay & Egan Co.	McIlvaine & Spiegel Boiler & Tank Co.

Cincinnati Shaper Co.  
Miller, Du Brul & Peters Mfg. Co.  
Kilby Mfg. Co.  
Cincinnati Milling Machine Co.  
Triumph Electric & Ice Machine Co.  
Chisholm & Moore Mfg. Co.  
Detroit Screw Works.  
Russell Wheel & Foundry Co.  
William Tod Co.

Tudor Boiler Mfg. Co.  
U. S. Cast Iron Pipe & Foundry Co.  
Samuel F. Hodge & Co.  
Murphy Iron Works.  
Byram & Co.  
C. & G. Cooper Co.  
American Tool Works Co.  
Northern Engineering Works.  
National Cash Register Co.

#### The Situation in Cincinnati.

CINCINNATI, OHIO, May 21, 1901.—(By Telegraph.)—The situation in machine circles here is, to say the least, very much strained. While the machinists are confidently claiming everything in sight, and are predicting an early settlement of their strike on the basis of their own demands, it is by no means certain that they will carry the day, at least as easily as they suppose. Out of some 30 machine shops, not including the small job shops, there have been found none at this writing which appear to be willing to compromise and accept the figures offered by the men. At a meeting this afternoon, which was attended by representatives from every manufacturing machine interest in this city, excepting one, it was decided to stand firm and not concede anything to the demands of the strikers. The following shops are practically closed, and all their men, numbering about 3500, are out, either actively engaged in or in sympathy with the strike:

American Tool Works Co.	Smith & Mills.
Laidlaw-Dunn-Gordon Co.	Fosdick & Holloway Machine Tool Co.
Cincinnati Milling Machine Co.	Cincinnati Planer Co.
J. A. Fay & Egan Co.	J. F. Towsley.
Lane & Bodley Co.	Cordeman Machine Co.
Bullock Electric Co.	Francis Fritsch Foundry & Machine Co.
George A. Gray Co.	Cordeman & Meyer.
Lodge & Shipley Machine Tool Co.	Greaves, Klusman & Co.
Schumacher & Boye.	Barker & Chard Machine Tool Co.
I. & E. Greenwald Co.	Wals & Roos Punch & Shear Co.
Cincinnati Shaper Co.	J. M. Robinson & Co.
Blymer Iron Works Co.	Steptoe & Co.
Bickford Drill Co.	Block & Pollak Co.
John H. McGowan Pump Co.	
R. K. Leblond Machine Tool Co.	
Silk, Anderson & Co.	

Besides these there are a few minor concerns. All profess to be very strong, and say they are in a first-class condition to stand a long fight. They claim to be prepared for an indefinite shut down, and think that before the situation changes materially on their part the ranks of the strikers will go to pieces. Five or six small job shops have conceded the strikers' demands, but the number of men employed in them and the amount of capital represented are almost infinitesimally small compared with those whose stocks are affected by the strike. The one manufacturer not represented at the meeting above referred to is known to be in full sympathy with the others who were present.

#### The Situation in Cleveland.

CLEVELAND, OHIO, May 21, 1901.—(By Telegraph.)—Thus far the strike of the machinists has failed to make more than a ripple on the local situation, but small as it is the outcome is somewhat of a surprise to local manufacturers, as it has been freely predicted that there would be no strike in this city. It was figured that the decisive failure of the machinists' strike last year, and the defeat of the molders this winter after one of the most severe struggles in the history of strikes, would have a wholesome influence on the machinists, and this has proved true. At the session of the Cleveland manufacturers' association, held this noon and attended by representatives of 35 leading concerns, it was reported that out of about 2400 machinists employed in Cleveland only 244, or less than 10 per cent., are out. Of these about 110 are employed by members of the local association. Losses were reported by association concerns as follows:

Variety Iron Works, 50; Cleveland Punch & Shear Company, 27; Chase Machine Company, 11; Farry Iron & Steel Company, 9; River Machine & Boiler Company, 9; others, 4. These included all who were absent from duty this morning, whether machinists or otherwise. Of the concerns outside the association Warner & Swasey



are the heaviest losers, 100 men being out. The balance are scattered among a large number of concerns. Not a shop is idle. The following large concerns have not lost a man:

Westinghouse Electric & Mfg. Co.	Ajax Mfg. Co.
Atlas Bolt & Screw Co.	Cleveland Machine Screw Co.
Acme Machinery Co.	Hill Clutch Co.
Brown Hoisting Machine Co.	American Steel & Wire Co.
Cleveland Ship Building Co.	Cleveland Twist Drill Co.
	Bardons & Oliver.

It was reported this evening that 60 men had left the Winton Motor Carriage Company, but investigations show only six. Several concerns report applications for work being made and it is believed there will be little difficulty in filling places. It is a noticeable fact that firms which were the most lenient with men last year, taking some back even though notorious agitators, are now the worst sufferers. Daily papers are printing interviews with the local business agent, indicating that 18 concerns have yielded to all the demands of the men. Investigation shows that this is true only in a very few cases. Two of these concerns will shortly move out of town and are rushing work, hence cannot afford to delay at any cost. Others are small concerns which have always been dominated by union influence. One concern has a contract which must be completed or suffer a heavy forfeit. Others claimed as having yielded operate on piece work, while two or three others have agreed to the nine-hour day without reference to wages. It is safe to say that not 100 men have had an increase in wages as a result of the strike. Labor leaders also claim victory in the Kilby Mfg. Company, Chisholm & Moore Mfg. Company and Long & Allstatter Company, the only members of the National Metal Trades Association in this city, but as a matter of fact they are holding to the New York Agreement, which concedes a 54-hour week after May 20, but leaves the question of wages to settlement between employer and employees.

The majority of members of the local association have always maintained the 55-hour week during summer months, and this will probably be continued this summer, although no joint action will be taken. Two leading manufacturers state that union leaders have made underhand offers to induce them to allow their names to be published as having granted all demands. In one case the men were to return to work if the management would state they had granted the desired increase. Thus far the greatest inconvenience has been felt by those who are depending upon out of town manufacturers to furnish goods required to complete contracts.

#### Ohio Points.

From different Ohio points we have the following:

The James Leffel & Co., Springfield, Ohio: "No demands and no trouble with our machinists."

The William Tod Company, Youngstown, Ohio: "Had no strike. Our machinists working 54 hours at same rates formerly paid for 57 hours."

Youngstown Foundry & Machine Company, Youngstown, Ohio: "Have settled with machinists; nine hours, ten hours' pay; no strike."

The Rarig Engineering Company, Columbus, Ohio: "We have no trouble regarding machinists' strike here."

The Aultman Company, Canton, Ohio: "No machinist strike here. Our men asked for half day Saturday, agreeing to make up time lost during the week. Request granted from June 1 to October 1."

National Machinery Company, Tiffin, Ohio: "No strike in our works. Not threatened to our knowledge."

The Morgan Engineering Company of Alliance, Ohio, refused the demands and their men have stopped work.

The Detroit Steel & Spring Works will not entertain any proposition for an increase of wages.

At Detroit, Mich., 17 of the 80 shops employing union men have granted the demands.

The Detroit Shipbuilding Company want their employees to work 55 hours a week.

The Boyer Machine Company, Detroit, offer 54 hours for the week's work, but say nothing about an increase in pay.

"The Detroit Shipbuilding Company will positively not sign the agreement with the striking machinists," said Superintendent Calder of the company to a local reporter. "Last November some of the machinists requested that we allow them nine and one-half hours' pay for nine and one-half hours' work, and when it came to a final decision in the matter we found that 79 favored the plan and 233 were opposed to it and wanted ten

hours' pay for ten hours' work. We acceded to this and granted the men one afternoon a week. For 55 hours' work they are now paid 56 hours' pay, and that is the best we will do."

At Grand Rapids, Mich., almost all the machinists, with their helpers, are out. The strikers are well organized and have adopted iron clad instructions to the effect that the men are to keep away from their places of employment, and not to interfere with their employers' business.

The Avery Stamping Company, Cleveland, Ohio, say: "We are not members of the association, but do belong to the local manufacturers' association. We have made no counter proposition to our men, nor do we intend to. Should the strike be of short duration it would not seriously cripple our output, providing we had no bad break downs in the meantime. If the strike should be protracted it would in time seriously cripple us; in fact we would be compelled to suspend operations almost entirely, providing outside labor could not be secured. Our plant is now being operated to its fullest capacity and our machinists are all at work, being satisfied, apparently, with the present scale."

#### Buffalo.

From the Buffalo district we learn the following:

The Buffalo Forge Company, Buffalo, N. Y., say: "Machinists out since May 1. No settlement made; no consultation held; same conditions exist in other shops except metal trade. Men went out Monday."

The Howard Iron Works, Buffalo, N. Y., say: "Strike of machinists at our works unsettled. Men been out since May 1."

A press dispatch from Buffalo says: "There are now 1100 machinists idle. Seven hundred of these men went out about three weeks ago when the demand for the nine-hour day was first made. The shops affected and the last men to go out in Buffalo were those of the Snow Steam Pump Works, 150; Lehigh Valley Railroad, 150; Iroquois Iron Works, 70; Buffalo Pitts Company, 35; Niagara Machine & Tool Company, 20. Negotiations are now in progress to obtain a settlement with some of the employers, but what the prospects are cannot be ascertained. A settlement with the Lake Erie Engineering Works was reported, the terms being a compromise. The company agree to give the men 11 per cent. increase instead of the 12½ per cent. demanded, and the nine-hour day is allowed." It has been announced that a settlement has been made with the Buffalo Engine Works.

All of the machinists employed at the Brooks Locomotive Works of Dunkirk are among the strikers. Erie and Oswego are both quiet and unaffected.

#### FIFTH DISTRICT.

##### Indiana and Illinois.

##### MEMBERS NATIONAL METAL TRADES ASSOCIATION.

Chandler & Taylor Co.	Charles Kaestner & Co.
Goss Printing Press Co.	John Davis Co.
Gardner Governor Co.	Illinois Screw Co.
Gates Iron Works.	Garden City Fan Co.
Fred. W. Wolf Co.	Latham Machinery Co.
Webster Mfg. Co.	National Machine Works.
Link-Belt Machinery Co.	Woods Motor Vehicle Co.
Adams & Westlake Co.	Chas. F. Elmes Engineering Works.
A. Plamondon Mfg. Co.	J. W. Reedy Elevator Mfg. Co.
Chicago Screw Co.	James Rowe.
F. C. Austin Mfg. Co.	Geo. E. Lloyd & Co.
Chisholm, Boyd & White Co.	Surerus & Greenhill.
Whiting Foundry Equipment Co.	Rockwood Mfg. Co.
M. C. Bullock Mfg. Co.	Lammart & Mann.
Pearson Machine Co.	Greenlee Bros. & Co.
Wm. R. Perrin & Co.	Dean Bros. Steam Pump Co.
Wier & Craig Mfg. Co.	W. H. Fauber.
Robert Tarrant.	Goodman Mfg. Co.
Fraser & Chalmers.	J. P. Allfree Mfg. Co.
Chicago Ship Building Co.	Walburn Swenson Co.
W. A. Jones Foundry & Machine Co.	Commercial Electric Co.

#### The Situation in Chicago.

CHICAGO, ILL., May 21, 1901.—(By Telegraph).—Practically no machinists' strike exists to-day in Chicago. The machinists' union has made the same demands here as in other parts of the country, but arbitrary action has not been taken in enforcing the demands. Workmen employed in the shops operated by members of the National Metal Trades Association have voted to abide by the result of an arbitration of the question of the demand for an advance in wages. The Arbitration Committee will meet within a few days to consider and decide upon this matter; no other question than wages is in dispute between the two organizations. Quite a number of the shops operated by manufacturers not

members of the Metal Trades Association have yielded to the demands of the union, and have conceded a reduction in the hours and ten hours' pay for nine hours' work. This has particularly been done by the manufacturers running establishments in which the machinists do not constitute a considerable part of the working force. These manufacturers concluded that in the present active condition of business they could not afford to have a strike which would probably compel the closing of their entire factories. In a few cases manufacturers absolutely refused to grant the demands of their men, and the latter have struck. These shops are not large, and it is estimated that the total number of machinists thus idle is about 50, or perhaps 75 at the most. Their circumstances being thus peculiar, the Chicago manufacturers are averse to making statements for publication, or giving their individual views of the situation. They confidently expect that this matter will be amicably settled within a week or two. Meanwhile the men will continue at work unless some unforeseen complication develops.

#### Illinois and Indiana.

We are advised by telegraph as follows:

Williams, White & Co., Moline, Ill.: "No settlement made in this city with machinists except one small shop."

The B. F. Barnes Company, Rockford, Ill.: "Have no trouble. All our men working. Everything satisfactory."

The Reeves Pulley Company, Columbus, Ind.: "We know no trouble. We are happy and contented; so are our workmen. Small burg *versus* large city."

The Ingersoll Milling Machine Company, Rockford, Ill.: "Have not heard of any trouble here."

#### SIXTH DISTRICT.

##### Minnesota and Wisconsin.

MEMBERS NATIONAL METAL TRADES ASSOCIATION.

Edward P. Allis Co.	S. Freeman & Son Mfg. Co.
J. I. Case Threshing Machine Co.	Twin City Iron Works.
Milwaukee Harvester Co.	Christensen Engineering Co.
Filler & Stowell Co.	Bucyrus Co.
	A. W. Stevens Co.

##### Milwaukee.

The situation in Milwaukee is reflected by the following telegrams:

The Filler & Stowell Company, Milwaukee, Wis.: "Machinists out since Monday in violation of New York agreement with the Metal Trades Association. They refuse arbitration. No settlement. All employers here united and firm in resisting unreasonable demands."

Edwin Reynolds of the E. P. Allis Company of Milwaukee, Wis., says: "All shops of any importance united in local association and refuse demands of machinists. All shops open. About 95 per cent. of men out on strike."

Pawling & Harnischfeger: "Strike situation with us same as on Monday. Manufacturers will not grant demands."

The Gisholt Machine Company of Madison, Wis., have had no strike.

At Minneapolis, Minn., 250 men have stopped work.

#### SEVENTH DISTRICT.

##### Iowa and Missouri.

MEMBERS NATIONAL METAL TRADES ASSOCIATION.

Curtis & Co. Mfg. Co.	Wagner Electric Mfg. Co.
Fulton Iron Works.	Medart Patent Pulley Co.
N. O. Nelson Mfg. Co.	Quick Meal Stove Co.
St. Louis Iron & Machine Works.	Central Union Brass Co.

There is no general strike of the machinists at St. Louis.

#### EIGHTH DISTRICT.

Kentucky, Tennessee, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Arkansas and Texas.

MEMBERS NATIONAL METAL TRADES ASSOCIATION.

Gelger, Flske & Koop.  
The shops at Norfolk and Berkeley, Va., are closed. At Louisville, Ky., 200 machinists have gone out. Two firms have granted the demands made by the men.

So far as reported there is only one establishment in New Orleans, La., having any trouble. This is at the Gardner Motor Works, where about 75 men are engaged.

Not a machinist struck in Birmingham, Ala., nor was any demand made, either in the shops of the Southern Railway or its local foundries. The men had not given notice of any grievances, and there is no prospect of any trouble.

All the machinists employed at the shipyard at New-

port News, Va., continue at work, and from present indications there will be no strike. No demands have been made, it is understood, and a conference with General Superintendent W. A. Post is said to have resulted satisfactorily to both sides.

At Petersburg, Va., all the machinists are on strike.

About 200 machinists are out in Richmond, Va. The greater number were employed at the locomotive works, the Trigg Shipyard and the Tredegar Iron Works, but it is stated that work at those plants will not be delayed for the present. None have quit at the Southern Railway shops, though it is understood that committees will be sent from the principal shops along the system to confer with the company's authorities at Washington.

#### NINTH DISTRICT.

##### All States and Territories Not Mentioned Above.

MEMBERS NATIONAL METAL TRADES ASSOCIATION.

Gardner Electric Drill & Machinery Co.	Denver Engineering Works Co.
Colorado Iron Works.	F. N. Davis Iron Works Co.

A press dispatch from San Francisco states that about 6000 men went out on Monday, including all the men in the Risdon Iron Works and 3200 out of 3800 men in the Union Iron Works. Irving M. Scott of the Union Iron Works said he had offered to grant a nine-hour day, but did not feel like increasing wages until he learned what the Cramps and other Eastern shipyards would do. It is probable that the men will accept this.

#### TENTH DISTRICT.

##### Provinces of Ontario and Quebec in the Dominion of Canada.

MEMBERS NATIONAL METAL TRADES ASSOCIATION.

The Northey Co., Ltd.	John Inglis & Sons Co.
Polson Iron Works.	Honolulu Iron Works.
Bertram Engine Works Co.	

## MANUFACTURING.

### Iron and Steel.

Neal Brothers have leased, with option of purchasing, the Anchor Rolling Mill of Chess Brothers, on the South Side, Pittsburgh, and are putting in two sheet mills and a finishing mill to roll iron and steel sheets in gauges from Nos. 16 to 30, and expect to be turning out sheets by July 1. Neal Brothers have been making muck iron and coating terne plate at this mill for the past three years. Their product of sheets will be between 15 and 20 tons per day.

Moorhead Brothers & Co., operating a puddle and skelp mill at Pittsburgh, have given their puddlers an unsolicited advance in wages from \$4.87 a ton to \$5. This mill is non-union, and has not recognized the Amalgamated Association for some years.

We understand that Minerva Furnace, at Milwaukee, Wis., which has been operated for the past two years under lease by the Minerva Pig Iron Company, has been purchased by John M. Thomas of Duluth Furnace, Duluth, Minn., who will probably remove Duluth Furnace to Milwaukee and rebuild a 200-ton furnace at the latter city.

The American Iron & Steel Mfg. Company, at Lebanon, Pa., employing 500 puddlers, have posted notices granting an increase from \$3.25 to \$3.50 per ton. Several weeks ago an increase of 25 cents was granted.

The Marine Mfg. & Supply Company of Pittsburgh will apply for a charter June 10. The concern propose to make iron and steel.

R. S. Henderson, trustee for the Wheatland Iron Company, at Wheatland, Pa., has signed the agreement giving the men a nine-hour day and 12½ per cent. increase in wages.

The improvements to be made this year by Jones & Laughlins, Limited, at their American Iron & Steel Works, Pittsburgh, were referred to fully in these columns last week. We may state, however, that this concern may build two more blast furnaces adjacent to their Eliza plant in Pittsburgh. These two stacks, if built, will have a daily capacity of about 600 tons each.

Fannie Furnace, at West Middlesex, Pa., owned by the Cherry Valley Iron Company of Pittsburgh, has been overhauled and put in first-class condition and will go into blast this week. The product will be Bessemer iron.

### General Machinery.

The Featherstone Foundry & Machine Company, Halsted street and Chicago avenue, Chicago, have just received an order for two 65-ton ice machines and another for two 100-ton refrigerating plants. They have also just closed a contract for supplying a large railroad company with castings the year around.

The Berlin Machine Works, Beloit, Wis., manufacturers of special wood working machinery, are contemplating enlarging their works by a substantial addition which will increase their working force from 400 to 600 men.

Henlon & Hubbell, manufacturers of and dealers in iron and



brass pumps and miscellaneous supplies, Fulton and Jefferson streets, Chicago, have incorporated under the same name with a capital of \$100,000. There is to be no change in management, but a larger stock is to be carried.

The McMillan Machine Company, Langdon, N. Dak., recently incorporated, have acquired the business of D. H. McMillan at Langdon and Hannah and that of C. W. Plain at Milton and Osnabroch. The company deal in farm machinery and now have branches at all the towns on the Great Northern Railway in Cavalier County. The officers are J. W. Mahon, president and manager; D. H. McMillan, vice-president, and George Vierhus, secretary and treasurer.

The Babcock & Wilcox Company, through their Pittsburgh office have received contracts and are installing 1500 horsepower Babcock & Wilcox vertical water tube boilers in the Bellaire Works of the National Steel Company at Bellaire, Ohio, and 5000 horse-power of the same type of boiler, together with stokers, in the Shenango Works of the National Steel Company at New Castle, Pa. In this latter job was some very nice engineering work in the placing of the boilers.

The Georgia Iron Works, Augusta, Ga., which were burned in December, 1899, have been rebuilt at a point in the city much more favorable for manufacturing and shipping than the old location. They are situated on Marbury street between the second and third levels of the canal that runs through the city and on the track of the C. & W. C. Railroad. The works consist of machine shop, 250 x 65 feet, and blacksmith shop at its rear, 50 x 50 feet; foundry, 125 x 52 feet, and the office and pattern shop occupy a building 70 x 35 feet. All the tools in use in the different departments are new and of the latest manufacture. The class of work done is manufacturing of heavy saw mill and phosphate machinery. They also manufacture castings and special machinery, such as shafting, pulleys and for power transmission. The whole of the time between date of the fire, December, 1899, and July 1, 1900, when the works commenced running, was occupied with rebuilding and installing equipment. Since starting entirely unsolicited business has come to the company that has kept the works running right along full time, and at present they have several contracts ahead, one of which will take them eight months to complete.

The John F. Riley Foundry & Machine Works, Charleston, S. C., which were completely destroyed by fire on March 7, have been rebuilt. The new building is about the same dimensions as the old, 170 x 70 feet, having two stories at the east end. The first floor of the building is taken up by the blacksmith shop, brass and iron foundry, and machine and boiler shop. The pattern shop is on the second floor. In the pattern shop all the machinery is new, and it is mostly so in the other departments. The house have an abundance of orders and are running full time.

The Riverside Iron Works, Charleston, S. C., are about to enlarge their boiler shop and contemplate putting in a marine railroad in the near future. The firm are convinced that this will be the means of leading vessels to come to Charleston for repairs that now go to other ports. The main part of the business done is that of repairs, but they are at all times open to estimate on new work. Business last year was good, and it so continues.

Arthur G. Enock of London, England, on a recent visit to this country placed an order with the York Mfg. Company, York, Pa., for a 5-ton refrigerating plant for a firm in England. At the same time he also placed a contract with the York Mfg. Company for two 20-ton ice making and refrigerating machines to be shipped to the Mauritius Islands.

The Emerson Pump Company of Baltimore have arranged to establish a pump factory at Alexandria, Va., on Southern Railway. They have secured an excellent location on the railroad and convenient to water transportation.

#### Engines and Boilers.

The Brown-Corliss Engine Company, recently organized at Milwaukee, Wis., with a capital stock of \$1,000,000, are reported to have selected a site at Western Junction, Wis., on the line of the Chicago, Milwaukee & St. Paul Railroad, some distance south of Milwaukee. They propose to build Corliss engines, and the organizers of the company expect to build up an industrial town, which may possibly be named Corliss.

The Stuart Boiler Company, whose incorporation was noted in these columns last week, have selected a site at Twenty-third and Papan streets, St. Louis, for their boiler and cupola plant. The plant is expected to be in operation by August of the present year.

Fanning Mfg. Company, manufacturers of the Fanning hot air engines for power and pumping, have removed from 153 and 155 West Jackson Boulevard, Chicago, to the old Manson bicycle plant, recently purchased by them, at Superior, Morgan and Pratt streets. The company will discontinue the manufacture of the Economy gasoline engines, and instead have begun to make automobiles. Their building is three stories high, and affords them three times as much room as they had formerly.

Shugers' Gasoline Engine Works, Coldwater, Mich., will build a one-story addition, 22 x 100 feet, to their plant in order to

keep up with the orders for their 1½ and 2½ horse-power engines.

J. L. Schofield's Sons Company, Macon, Ga., have purchased 7 acres of land in the immediate suburbs of the city and will erect new machine shops, foundry and boiler shop, warehouse and office. They hope to be in the new location and have the works in full operation within six months.

The Mallory & Taylor Iron Works, Macon, Ga., who for some years have acted as agents for the sale of stationary engines of different manufacture, are now putting an engine on the market of their own design and manufacture. At present they are building it in sizes ranging up to 50 horse-power, and have commenced to make patterns which will enable them to build up to 100 horse power. They have placed three engines in Macon.

The William Tod Company, engineers, founders and machinists, Youngstown, Ohio, have received an order from Jones & Laughlins, Limited, of the American Iron & Steel Works, at Pittsburgh, for two tandem compounds, with 40-inch high pressure cylinder, 78-inch low pressure cylinder, which are to drive one of the new mills to be built for that firm. These engines are to be of the tandem compound construction, with the low pressure cylinder having an umbrella piston and supported by the rod, which has a slipper or crosshead between the low pressure cylinder and the high pressure cylinder. The low pressure cylinder is to be placed next to the bed. The engines will be controlled by a shaft governor, driven from the crank pin by the drag link. Piston valves will be used on both cylinders. The beds of these engines will weigh above 120,000 pounds each. The very highest grade of construction will be used throughout, and it is expected when they are finished that they will embody all the best principles of modern engineering.

The Westinghouse Machine Company of East Pittsburgh posted notices last week that hereafter the working time limit will be 54 hours per week, thus granting voluntarily the nine-hour day to the machinists. The practice of the shops of this concern heretofore has been to work 59 hours per week, and the new rule permits an advantage to the workmen as to overtime earnings. The advance was entirely voluntary on the part of the firm and affects about 1500 men.

#### Foundries.

The Atlas Foundry, Carroll avenue and Leavitt street, Chicago, which was operated by the Atlas Foundry Company, has been closed, and a receiver appointed for the company.

The Florida Machine Works, Jacksonville, Fla., iron and brass castings and forgings and general repairing and finishing, are building a new 25-ton plate ice plant adjoining their works.

C. O. Hart, representing a new corporation under the name of the United States Steel Castings Company, has purchased a large tract of land at Chicago Heights, Ill. The identity of those interested in the new company has not been disclosed, but they are stated to be partly domestic and partly foreign capitalists. The plant will be an extensive one, as the main building will be 300 x 700 feet.

The Chicago Hardware Foundry Company, whose main offices and plant are situated at North Chicago, Ill., are just completing the erection of a foundry building 65 x 80 feet. They are about to commence construction on a brass foundry 40 x 60 feet, which will also be used as their general brass department. The company report that their business in the last few months has increased very materially, and with the completion of the additions their capacity will be increased by nearly 35 per cent. They manufacture special gray iron and brass castings. John Sherwin is president and E. P. Sedgwick is secretary and treasurer.

Frank Toepfer has retired from the firm of W. Toepfer & Sons, ironworkers, at Milwaukee, Wis. Peter G. Toepfer will continue the business under the same name.

The N. S. Sherman Machinery Company, Oklahoma City, Okla., founders and machinists, will erect a foundry with several times the capacity of their present one, and will be in the market for cupola, supplies, &c. They will also erect a large warehouse and do a jobbing business in machinery supplies.

The Columbus Forge & Foundry Company, Columbus, Ohio, are building a one-story frame forge shop, 50 x 150 feet, to cost \$35,000.

J. C. Shepard is organizing a stock company at Gallipolis, Ohio, to operate a foundry. Wharf property 350 feet front has been secured upon which the company propose to erect a building 60 x 350 feet, to be used for molding room.

North Wisconsin Boiler Works & Foundry, Ashland, Wis., brass and iron castings, are building a new foundry, 40 x 100 feet, which is expected to be completed early in June.

The Carbondale Metal Works Company are being organized at Carbondale, Pa., with a capital of \$30,000. They will occupy a plant 72 x 200 feet which will be equipped for the manufacture of stoves, furnaces, hot air, hot water and steam heaters and commercial iron generally. The plant is expected to be in operation by August 15.

#### Machine Tools.

The Western Tool Works, who recently moved to the Electrical Building, 118 to 132 West Jackson Boulevard, Chicago,

have added considerable equipment to their plant, and are now in good shape to fill orders for special tools and machinery. The firm have received a number of large orders from Chicago manufacturers for dies, taps and special tools.

#### Bridges and Buildings.

The Columbia Bridge Company of Pittsburgh, who recently removed their works from Edensburg, Pa., to Carnegie, near Pittsburgh, expect to start their new works at the latter place this week. The new plant is much larger than the old one and has capacity for handling about 1000 tons of material per month. The Columbia Bridge Company have some large contracts on hand, including some new buildings for the Mahoning Rubber Company, at Youngstown, Ohio, a large extension to the glass works of the Macbeth Evans Glass Company at Charleroi, Pa., and also a large steel addition to the works of the Pittsburgh Window Glass Company at Washington, Pa.

#### Hardware.

The Janesville Barb Wire Company, Janesville, Wis., have purchased additional land in the rear of their present property for the purpose of enlarging their plant.

The Pelouze Scale & Mfg. Company, manufacturers of all kinds of scales, Chicago, have removed from 135 South Clinton street to the sixth story of the building at 118 to 132 West Jackson Boulevard. The floor is 90 x 100 feet, and will afford them almost twice as much room as they had at their former location. They have also increased their capacity 25 per cent. by the installation of several machine tools, and expect to add the manufacture of a number of hardware specialties to their regular lines.

The Columbian Hardware Company, successors to Van Wagner & Williams Hardware Company, Cleveland, Ohio, announce that their spring hinge department has been reorganized, is better equipped than ever, and that they are now ready to supply the well-known Gem and other styles.

Mr. Manes of Chattanooga, Tenn., has patented a reversible disk plow which has been tested from time to time during the past eight months with a view to perfecting it. On the 15th inst. he made a public exhibit of its workings, there being present a number of manufacturers of the city. Mr. Manes has put his affairs in the hands of O. F. Janes of Chattanooga, who will determine whether to organize a company or have the plow manufactured on royalty.

The Chicago offices and factory of the Chicago Screw Company have been removed from 94 West Washington street to the manufacturing building on the northwest corner of Randolph and Canal streets. The company have opened another extensive factory, covering an area of 75,000 square feet, at Detroit, Mich., and will hereafter be able to serve the Eastern trade more satisfactorily.

The Westinghouse Airbrake Company of Pittsburgh will engage in the manufacture of air brakes for traction cars. The patents and good will of the Standard Brake Company of New York have been purchased by the Westinghouse Company, and a company known as the Standard Traction Brake Company, with a capital of \$100,000, have been incorporated in New Jersey by H. H. Westinghouse, E. M. Herr and Robert S. Green of the Westinghouse Airbrake Company. This new company are owned by the Westinghouse Airbrake Company and will at once thoroughly develop the traction field. The Standard Brake Company operated a small plant in New York, but the Westinghouse interests will have the industry removed to their works at Wilmerding. The brakes are similar to those in use on railroads except that the air pumps are operated from the car axles. The new brake is very compact and is said to be highly efficient. Some experiments have been made in Pittsburgh with air brakes on traction cars, but they have not been generally adopted, most of the cars now in operation being still controlled by the old hand brake. Some of the latest cars on the Consolidated Traction Company lines are operated by an electric brake which so far has proven satisfactory. The claim for the air brake is that it stops the car easily, and yet has such absolute control over it that the speed can be checked in a minimum distance.

At Baltimore, Md., Monday, May 20, an order was signed fixing June 12 as the date for the sale of the Columbian Iron Works, and naming H. C. Frick and H. R. Preston as commissioners to conduct the sale. The Baltimore Ship Building & Dry Dock Company, who are being organized to buy in the property and enlarge its operation, will probably be chartered this week. Additional subscribers to-day to the syndicate forming this company are General John Gill, Colonel Seymour Mandelbaum, Samuel S. Shoemaker, Robert Taylor and William P. Harvey. It will be capitalized with \$200,000 of bonds, \$250,000 of preferred stock, and \$300,000 of common stock. This will provide ample means to equip the works with up to date machinery.

The Wisconsin Graphite Company will build a large plant in the Pittsburgh district; the exact site has not yet been selected.

The Mt. Pleasant Coke Company have been chartered and will build 120 coke ovens and 40 tenement houses in the Connelville coke region.

#### Miscellaneous.

Jones & Bixler Mfg. Company, Freemansburg, Pa., who recently incorporated, have succeeded to the iron toy manufacturing business formerly carried on by Jones & Bixler. Increased business has necessitated the enlargement of their plant, and they are building an addition, 45 x 90 feet, to the wareroom and an enameling room 24 x 36 feet.

J. J. Hill has purchased the interest of J. C. Rogers in the machine shop business of Rogers & Basham, Owensboro, Ky. The business is now run under the name of Hill & Basham, and the new firm are building additional rooms for the building of bugles in connection with the repair shop.

Bratsch & Field, Renville, Minn., dealers in farm machinery, implements and vehicles, have completed an additional warehouse, 50 x 70 feet.

Barth Mfg. Company, successors to Weller & Barth, whose electrical elevator factory at Milwaukee, Wis., was destroyed by fire recently, have secured a building fully equipped with power and have now resumed operations. The tools and most of the machinery were little damaged, so that aside from the actual interruption of work they will lose nothing, and expect to be in better shape than ever to get out work promptly.

The Handlan-Buck Mfg. Company, St. Louis, Mo., recently incorporated, have succeeded to the plant and business of the M. M. Buck Mfg. Company. The new company will be composed of the same persons as the old and will continue the manufacture of copper, brass and tin wares as well as a large variety of track tools and other devices especially designed for railway service, which has been established for more than 35 years. A. H. Handlan, who has been identified with the business since its beginning, is president.

Articles of incorporation have been issued to the Wagner Plow Company of Indianapolis, Ind., successors to J. H. Wagner & Co. of Vernon, Ind. The company's capitalization is \$75,000. The following have been elected directors: Everett Wagner, John W. Holtzman, Henry Schmuil, Chapin Wagner, Irby S. Wagner, William W. Buchanan, and Edward K. Chapman. A complete modern factory will be built.

The improvements and additions which the Parlin & Orendorff Company, manufacturers of agricultural implements, Canton, Ill., have planned for this season are under way, the most prominent being the new warehouse, which it is hoped to have completed by July 1. This building, which is being erected on the block recently acquired by the company, will add about 112,000 square feet of floor space for storage purposes, and will place the company in a position to properly handle their increasing business. Four new side tracks, each approximating 750 feet, have been laid, and the company will have a capacity for loading 40 cars at one time, when occasion demands it. Material for the new foundry is on the ground. For the better and more expeditious handling of the work a temporary sawmill has been erected on the new block, the power being supplied by a motor connected with the company's electrical plant.

The Roberts Portable Oven Company, 179-183 Illinois street, Chicago, manufacturers of the Black Diamond portable ovens, have engaged in the manufacture of a new style of core ovens.

The Goetz & Brada Mfg. Company, 18 to 24 Michigan street, Chicago, will soon commence to erect a plant on the land which was recently purchased by them at Chicago avenue and Sangamon street. The factory will comprise a main building 115 x 210 feet, and a boiler and blacksmith shop, each 30 x 60 feet. The large building will be of brick and steel, and will be four stories high. The first floor will be occupied by the tank shop, the second by the machine shop, the copper department and offices will be located on the third story, and the brass foundry and finishing room on the fourth floor. All the departments and shops will be equipped with the latest appliances, and the cost of the land and the buildings alone will aggregate \$100,000. The company hope to have their plant in operation by September of the present year.

The Grand Rapids Brass & Iron Bed Company, Limited, have been incorporated with a capital of \$70,000 to engage in manufacturing at Grand Rapids, Mich. They have purchased a plant formerly used for another line of manufacturing and will remodel it for their purpose, adding buildings for a foundry and other necessary departments, which they expect to have ready for occupancy about July 1. Meanwhile they will conduct business in the building hitherto used by the Brass & Iron Bed Company, dissolved. G. W. Perkins is chairman, Addison A. Barber vice-chairman, E. P. Chamberlin secretary, and C. F. Rood treasurer. The general superintendent is J. W. Williams, who has been connected for 18 years with the Simmons Mfg. Company, Kenosha, Wis.

The Automatic Smoke Preventer Company, 144 Hartford Building, Chicago, have closed a contract for six automatic smoke preventers for the State Prison at Joliet.

The Mallory Mill Supply Company, Macon, Ga., have recently added an agricultural department to their business. They have agencies of leading Northern and Western manufacturers of agricultural implements in the territory they cover. Their business this year in general mill supplies so far shows a healthy increase over last.



## The Iron and Metal Trades.

The Iron and Steel markets have quieted down further. The impression seems to have gained ground among consumers that there is no danger of any advance in price for the second half of the year, while there is a possibility of a slight decline in some lines should consumption fail to keep up to the present extraordinary rate. There is no evidence that such is the case, however. It is only an inference from the fact that the spring and early summer is the season of maximum consumption in many branches connected with outdoor operations.

It is admitted that new contracts are not coming in as rapidly as they did a month or more ago. But it is certain that in some lines, for instance in the Wire trade, current new orders are coming in fast enough to prevent any relief in catching up in spite of the fact that every plant is being run to full capacity. The same is true in the Sheet trade, while in the Bar industry the implement makers are steadily piling up their new demands on the mills. The structural plants are exceedingly busy and contractors say that competition for what work is coming up is not so sharply competed for. The Plate mills are getting some very good orders for the Texas oil territory.

The Cast Iron Pipe trade is reported to be very active, and it is from this quarter that the majority of the larger orders for Pig Iron placed during the week have come. Still the makers of Foundry Iron are displaying some uneasiness, the producers in the East being conspicuous in this respect.

While reports indicate a firmer feeling in Europe, the prices there for Pig Iron are so far below parity here that there is little chance of business unless the relative position of the two markets changes very materially.

Outside of moderate lots of Ferromanganese, which are being sold for importation, notably along the coast, no foreign material of consequence is coming in. It is in Canada, however, that foreign Steel is being offered at about 90 shillings, c.i.f. Montreal, while Wire Rods are quoted £6, c.i.f. Montreal.

The machinists' strike has not yet had any perceptible influence on the trade, nor is it likely to unless prolonged far beyond the time it promises to occupy now.

The result of the deliberations of the Amalgamated Association at Milwaukee will be looked forward to with interest.

## A Comparison of Prices.

At date, one week, one month and one year previous.

### Advances Over the Previous Month in Heavy Type. Declines in Italics.

	May 23, 1901.	May 15, 1901.	Apr. 24, 1901.	May 24, 1900.
<b>PIG IRON:</b>				
Foundry Pig, No. 2, Standard, Philadelphia.....	\$15.00	\$15.25	\$15.50	\$21.75
Foundry Pig, No. 2, Southern, Cincinnati.....	15.75	13.75	14.50	20.00
Foundry Pig, No. 2, Local, Chicago.....	15.50	15.50	15.50	23.00
Bessemer Pig, Pittsburgh.....	16.25	16.25	16.75	24.50
Gray Forge, Pittsburgh.....	14.75	14.75	14.75	20.00
Lake Superior Charcoal, Chicago....	17.50	18.00	18.00	25.00

### BILLETS, RAILS, ETC.:

Steel Billets, Pittsburgh (nom.)....	24.00	24.00	24.00	31.00
Steel Billets, Philadelphia (nom.)..	26.50	26.20	27.00	nom.
Steel Billets, Chicago (nom.).....	.....	.....	26.00	nom.
Wire Rods (delivered).....	39.00	39.00	38.00	nom.
Steel Rails, Heavy, Eastern Mill....	28.00	28.00	28.00	35.00
Spikes, Tidewater.....	1.80	1.80	1.60	2.43
Splice Bars, Tidewater.....	1.40	1.40	1.40	2.20

### OLD MATERIAL:

O. Steel Rails, Chicago, gross ton..	13.50	13.50	14.50	17.50
O. Steel Rails, Philadelphia.....	16.25	16.75	17.00	22.00
O. Iron Rails, Chicago, gross ton..	19.00	19.00	20.00	21.00
O. Iron Rails, Philadelphia.....	19.50	19.50	19.50	24.00
O. Car Wheels, Chicago, gross ton..	18.50	16.50	16.50	24.00
O. Car Wheels, Philadelphia..	17.50	17.50	17.50	23.00
Heavy Steel Scrap, Chicago, gr. ton	13.50	13.50	14.00	16.00

### FINISHED IRON AND STEEL:

Refined Iron Bars, Philadelphia.....	1.50	1.50	1.50	2.00
Common Iron Bars, Chicago.....	1.55	1.55	1.60	2.05
Common Iron Bars, Youngstown....	1.45	1.45	1.50	2.00
Steel Bars, Tidewater.....	1.62½	1.62½	1.60	2.15
Steel Bars, Pittsburgh.....	1.40	1.45	1.40	2.00
Tank Plates, Tidewater.....	1.80	1.80	1.80	2.00
Tank Plates, Pittsburgh.....	1.60	1.60	1.60	1.80
Beams, Tidewater.....	1.75	1.75	1.75	2.40
Beams, Pittsburgh.....	1.60	1.60	1.60	2.25
Angles, Tidewater.....	1.75	1.75	1.75	2.40
Angles, Pittsburgh.....	1.60	1.60	1.60	2.25
Skelp, Grooved Iron, Pittsburgh....	1.75	1.75	1.80	1.90
Skelp, Sheared Iron, Pittsburgh....	1.80	1.85	1.75	1.90
Sheets, No. 27, Pittsburgh.....	3.20	3.20	3.25	3.15
Barb Wire, f.o.b. Pittsburgh.....	2.90	2.90	2.90	2.90
Wire Nails, f.o.b. Pittsburgh.....	2.20	2.20	2.20	2.20
Cut Nails, Mill.....	2.00	2.00	2.00	2.10

### METALS:

Copper, New York.....	17.00	17.00	17.00	17.00
Spelter, St. Louis.....	3.80	.....	3.77½	4.50
Lead, New York.....	4.87½	4.87½	4.87½	4.70
Lead, St. Louis.....	4.23½	.....	4.23½	4.55
Tin, New York.....	27.50	26.10	26.00	30.00
Antimony, Hallett, New York.....	8.75	8.75	8.75	9.75
Nickel, New York.....	60.00	60.00	58.00	42.00
Tin Plate, Domestic Bessemer, 100 lbs., New York.....	4.19	4.19	4.19	4.94

### Chicago. (By Telegraph.)

Office of The Iron Age, 1206 Fisher Building,  
Chicago, May 23, 1901.

The machinists' strike has so far not had an appreciable effect on business. The Chicago machinists have gone out in only a few shops, and these do not include any of the largest ones. The strike will have to continue for some time and become more effective in closing works to have much adverse influence on trade. The branches which were active last week are still active, while those which were inclined to quietness are not any more so than then. Those branches in which quiet prevails are well situated with respect to future business. The Illinois Steel Works are crowded to their full capacity in every department, and from present appearances have all they can possibly turn out to the closing months of the year. The Wire trade is phenomenally active and manufacturers are unable to make anything like satisfactory deliveries. Railroad companies are in the market for more cars and the demand for material from this source keeps up steadily.

**Pig Iron.**—The only transaction of any moment was the purchase by a car wheel company of several thousand tons of Southern Foundry and Lake Superior Charcoal. The general market has been quiet, although the aggregate of small transactions reaches a respectable tonnage when the business of the week is footed up. Southern furnace companies are inclined to bid for new

business, and prices of Southern Iron have therefore been reduced about 50c. a ton. The Northern furnace companies are differently situated, their product being well sold far into the fall months, and they are not disposed at present to make concessions. We quote as follows:

Lake Superior Charcoal.....	\$17.50 to \$18.00
Local Coke Foundry, No. 1.....	16.00 to 16.50
Local Coke Foundry, No. 2.....	15.50 to 16.00
Local Coke Foundry, No. 3.....	15.00 to 15.50
Local Scotch, No. 1.....	16.25 to 16.50
Ohio Strong Softeners, No. 1.....	16.50 to 16.75
Southern Silvery, according to Silicon.....	15.65 to 16.15
Southern Coke, No. 1.....	15.40 to 15.90
Southern Coke, No. 2.....	14.90 to 15.40
Southern Coke, No. 3.....	14.40 to 14.90
Southern Coke, No. 1 Soft.....	15.40 to 15.90
Southern Coke, No. 2 Soft.....	14.90 to 15.40
Foundry Forge.....	13.90 to 14.40
Gray Forge and Mottled.....	12.65 to 13.90
Southern Charcoal Softeners, according to Silicon.....	15.50 to 17.00
Tennessee Silicon Pig.....	16.00 to 17.00
Alabama and Georgia Car Wheel.....	20.65 to 21.00
Malleable Bessemer.....	to 16.50
Standard Bessemer.....	18.00 to 18.50
Jackson County and Kentucky Silvery, 8 per cent. Silicon.....	16.00 to 17.00

**Bars.**—Greater activity is reported in the Bar Iron trade than in any other branch. Contracts are being freely placed for future delivery by implement manufacturers and other large consumers. The tonnage thus covered in the past week was about as heavy as during the previous week, and the outlook is in favor of more good business. Iron for prompt shipment is scarce, with quite a sharp demand. A little falling off is reported in orders for Steel Bars, for which the mills are thankful, as their capacity is not only sold up, but great difficulty is experienced in securing Steel Billets. Mill shipments are quoted at 1.55c. to 1.60c., Chicago, for Common Iron; 1.60c. to 1.65c. for Soft Steel Bars, and 2c., base, for Hoops. Jobbers report the demand apparently more pressing than before because their stocks are so badly broken. They are having continuous urgent calls for sizes which cannot be supplied as desired. Small lots are held at 1.90c. to 2c. for either Iron or Steel Bars, and 2.20c. to 2.25c., base, for Hoops.

**Structural Material.**—Bids are now being made on an Indianapolis house which will require 1500 tons. The demand for small lots is a satisfactory feature of the market, the daily tonnage running up to good figures. Mill shipments are quoted as follows: Beams, Channels and Zees, 15 inches and under, 1.75c.; 18 inches and over, 1.85c.; Angles, 1.75c. rates; Tees, 1.80c.; Universal Plates, 1.75c. to 1.85c.; small lots of Beams and Channels from local yards are quoted at 2.25c.; Angles, 2c. rates; Tees, 2.15c.

**Plates.**—Some of the mills are still far behind on shipments, but others are able to take more business for delivery within a month or six weeks, as their customers are not specifying as well as expected. A somewhat better demand has sprung up for mill shipments, while store trade is heavy, being larger than in previous corresponding periods. Prices are firmly held. Mill shipments are quoted as follows: Tank Plate, ¼-inch and heavier, 1.75c. to 1.80c., Chicago; Flange, 1.85c.; Marine, 1.95c. Jobbers are selling small lots from store at 1.90c. to 2c. for Tank and 2.25c. for Flange, with the usual extras for heads, segments, lighter gauges, &c.

**Sheets.**—Manufacturers still report much difficulty in satisfying the trade. New business is coming up in good volume, while shipments on contracts are being distributed *pro rata* among the buyers in the effort to satisfy their most pressing requirements. Consumers are offering sharp premiums for early shipments of Heavy Sheets. Jobbers report a continued large trade in Galvanized Sheets from stock owing to the backwardness of mills in making deliveries. The trade of this character is still coming from a wider territory than usual. Small lots of No. 27 Black Sheets from stock are quoted at 3.40c. to 3.50c., and Galvanized, 70 off.

**Merchant Pipe.**—The manufacturers report a brisk demand, which keeps the mills constantly in arrears on shipments. Manufacturers' prices, random lengths, are as follows:

	In carloads.	Less than carloads.
	Blk. Galvd.	Blk. Galvd.
½ to ¾ inch and 11 to 12 inches.....	59.2	46.2 54.9 40.9
¾ to 10 inches.....	66.7	53.3 61.9 49.9

**Cast Pipe.**—Individual orders are not large, but the volume of business is heavy and the Pipe foundries are more crowded with work than they have been for years. Prices have recently shown some tendency to harden.

**Boiler Tubes.**—The movement from stock is not so large as it has been, but is still quite satisfactory. Quotations on less than carload lots from jobbers' stocks are as follows:

	Steel.	Iron
1 to 2½ inches.....	50	40
2½ to 5 inches.....	57½	47½
6 inches and longer.....	50 and 5	47½

**Rails and Track Supplies.**—An export order for 5000 tons of Rails is in the market. Manufacturers, however, are not figuring very closely on it, being naturally somewhat indifferent to this business. Inquiries are still being received for Rails for summer delivery which the manufacturers are unable to entertain. Prices are unchanged at \$28 to \$33, according to section. Track Fastenings are in sharp demand, with works well sold. Quotations are as follows: Splice Bars, 1.75c. to 1.80c.; Spikes, 1.95c. to 2c.; Track Bolts, with Hexagon Nuts, 2.80c., with Square Nuts, 2.65c.

**Billets.**—Open Hearth Billets continue to be quoted at \$32.80, Chicago, but manufacturers of Bessemer Billets are apparently completely out of the market. The statement made last week that Bessemer Billets could be sold at \$38 was a typographical error; it should have been \$30.

**Merchant Steel.**—One of the leading Merchant Steel companies doing business in this field report the largest April shipments in their history. They have had a good year, but this is running in excess of their previous experience. Implement contracts are still being placed, some good orders having been closed the past week. The demand from the general trade is of an excellent character, jobbers particularly pressing for prompt shipment on their contracts. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery Steel, 2c. to 2.10c.; Smooth Finished Tire, 1.85c. to 2c.; Open Hearth Spring Steel, 2.30c. to 2.40c.; Toe Calk, 2.40c. to 2.60c.; Sleigh Shoe, 1.85c. to 1.90c.; Cutter Shoe, 2.40c. to 2.60c.; Cold Rolled Shafting, 55 off. Ordinary grades of Crucible Tool Steel are quoted at 6c. for carloads and 7c. from store; Specials, 13c. upward.

**Old Material.**—Weakness has especially developed in high grade Wrought Scrap, and Cast Scrap accumulations are large and holders have been pressing sales, causing prices to give way. The outlook apparently favors a still lower range of values. The following are approximate quotations per gross ton:

Old Iron Rails.....	\$19.00 to \$20.00
Old Steel Rails, mixed lengths.....	13.50 to 14.00
Old Steel Rails, long lengths.....	16.00 to 17.00
Heavy Relaying Rails.....	21.00 to 22.00
Old Car Wheels.....	16.50 to 17.00
Heavy Melting Steel Scrap.....	13.50 to 14.00
Mixed Steel.....	11.50 to 12.00

The following quotations are per net ton:

Iron Fish Plates.....	\$16.50 to \$17.00
Iron Car Axles.....	19.50 to 20.00
Steel Car Axles.....	16.00 to 18.50
No. 1 Railroad Wrought.....	15.00 to 15.50
No. 2 Railroad Wrought.....	12.50 to 13.00
Shafting.....	15.50 to 16.00
No. 1 Dealers' Forge.....	12.50 to 13.00
No. 1 Busheling and Wrought Pipe.....	11.00 to 11.50
Iron Axle Turnings.....	10.00 to 10.50
Soft Steel Axle Turnings.....	9.50 to 10.00
Machine Shop Turnings.....	9.00 to 9.50
Cast Borings.....	4.00 to 4.50
Mixed Borings, &c.....	4.50 to 5.00
No. 1 Boilers, cut.....	12.00 to 12.50
No. 2 Boilers, cut.....	10.00 to 10.50
Heavy Cast Scrap.....	11.00 to 11.50
Stove Plate and Light Cast Scrap.....	8.50 to 9.00
Railroad Malleable.....	11.50 to 12.00
Agricultural Malleable.....	10.50 to 11.00

**Metals.**—Copper is unchanged at 17½c. for carload lots of Lake Superior and 17¼c. for Casting brands. Pig Lead is held at 4.32½c. for Desilverized and 4.42½c. for Corroding in 50-ton lots.

**Coke.**—Supply is increasing and prices are easier. Good Coke can now be had at \$4.50 for 72-hour Foundry, although the Standard Connellsville Coke is held at \$5.



## Philadelphia.

Office of *The Iron Age*, Forrest Building, {  
PHILADELPHIA, Pa., May 21, 1901. }

Continued dullness is about all that can be reported in regard to the Iron and Steel trades. Deliveries are being taken as fast as material can be prepared, so that while there is dullness in buying and selling, still there is no lack of activity in the manufacturing department. It would be more satisfactory, however, if buyers would show a greater interest in regard to renewal of contracts, but they appear to be utterly indifferent, and disposed to let the market drift along until such time as their necessities will compel them to renew contracts; but how soon this will be it is impossible to say. Sellers are evidently preparing for a somewhat lower range of prices, however, and if firm offers could be had on good sized lots there is little doubt that buyers would be met on very attractive terms.

**Pig Iron.**—The feeling to which we have made reference is particularly marked in Pig Iron, and prices are undoubtedly working toward a somewhat lower level. The great difficulty is to secure firm offers, buyers for the present being very undecided as to what action should be taken, the result in most cases being a postponement of operations and a waiting for further developments. It is difficult to quote prices on such a market, as there is no basis for actual figures beyond what is shown in the purchase of small lots, and which are liable to be misleading as to the true situation. It may be said, however, that \$15 to \$15.50 for No. 2 X, delivered, has been done during the week, but only in a limited way, prices in all cases being dependent upon the quantity, quality and delivery. There appears to be nothing doing in special Irons, and no great pressure to sell, although there is little doubt that quoted rates could be shaded on the right kind of business. Prices for city and nearby points are about as follows: No. 1 X Foundry, \$16 to \$16.25; No. 2 X Foundry, \$15 to \$15.50; No. 2 Plain, \$14.50 to \$15; Standard Gray Forge, \$14.25 to \$14.50; Ordinary Gray Forge, \$14; Basic (Chilled), \$14.25 to \$14.50.

**Billets.**—No business doing; prices nominally \$26 to \$26.50 for Ordinary Soft Steel, with the usual advance on special grades.

**Finished Material.**—New business is slow compared with what it was during the first three or four months of the year, and prices have a rather languid appearance. The Bar Iron Association appear to have made an arrangement which is said to be entirely satisfactory to themselves, and will include all the Bar mills in the country. Pittsburgh is recognized as the center and all prices are to be based on Pittsburgh quotations, plus freights to any particular point. This arrangement looks well enough on paper and may work out all right, although, as usual, there are some who profess to have no faith in it. While there is a good market and plenty of business to go around, it will no doubt be all right, but the test will come when the demand falls off and somebody has to suffer from shortage in work. There is nothing in the outlook to indicate any very important change in the situation, however, although there is not as much business coming in as could be desired and the feeling is less confident than it was during the earlier portion of the year. Prices remain as follows for city and nearby deliveries: Plates,  $\frac{1}{4}$  inch and thicker, 1.80c. to 1.85c.; Universals, 1.80c. to 1.85c.; Flange, 1.90c. to 2.10c.; Angles, 1.75c. to 1.85c.; Beams and Channels, 15 inch and upward, 1.75c. to 1.85c.; Bars Iron, 1.50c. to 1.60c.; Bars, Steel, 1.62 $\frac{1}{2}$ c. to 1.70c., delivered; Best Sheets, No. 10, 2.50c.; No. 14, 2.70c.; No. 16, 2.90c.; Nos. 18-20, 3.40c.; Nos. 21-24, 3.50c.; Nos. 26, 27, 3.65c.; No. 28, 3.75c. to 3.80c. (Common Sheets two-tenths less).

**Old Material.**—There is a marked falling off in the demand for Old Material, and prices are generally lower, more particularly for the higher qualities of material, which consumers think have been bringing relatively too much money. Bids and offers are about as follows for deliveries in buyers' yards: Choice Railroad Scrap, \$19 to \$20; Country Scrap, \$16 to \$17; No. 2 Light Scrap, \$12.50 to \$13.25; Machinery Cast, \$13.75 to \$14.25; Heavy

Steel Scrap, \$16.50 to \$17; Old Iron Rails, \$19.50 to \$20; Old Steel Rails, \$16.25 to \$16.50; Wrought Turnings, \$12 to \$12.50; Cast Borings, \$8.75 to \$9; Old Car Wheels, \$17.50 to \$18; Iron Axles, \$21.50 to \$22.50; Steel Axles, \$17 to \$18.

## Cincinnati. (By Telegraph.)

Office of *The Iron Age*, Fifth and Main streets, {  
CINCINNATI, May 22, 1901. }

There has been no perceptible change in the general situation of the Pig Iron market at this point. A feeling of apathy covers the entire market and neither buyers nor sellers appear to care which way the wind blows just at present. Nobody is manifesting the least interest in the trend of quotations, consequently it is a difficult proposition to say just what Iron is worth at this writing. One thing quite certain is that the market is rather weak at the quotations given herewith, and while a number of sellers maintain that there is no likelihood of a further decline, others assert that a proposition to buy a round lot of Iron would bring out figures lower than the minimum given herewith. Trading has been confined to small lots of odds and ends, and it is not likely to pass that limit within the near future. Freight rate from Birmingham is \$2.75 to this point; from Hanging Rock district, \$1. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1.....	\$14.25 to \$14.75
Southern Coke, No. 2.....	13.75 to 14.25
Southern Coke, No. 3.....	13.25 to 13.75
Southern Coke, No. 4.....	12.25 to 13.00
Southern Coke, No. 1 Soft.....	14.25 to 14.75
Southern Coke, No. 2 Soft.....	13.75 to 14.25
Southern Coke, Gray Forge.....	12.25 to 12.50
Southern Coke, Mottled.....	12.25 to 12.50
Ohio Silvery, No. 1.....	15.50 to 16.00
Ohio Silvery, No. 2.....	14.50 to 15.00
Lake Superior Coke, No. 1.....	15.50 to 15.75
Lake Superior Coke, No. 2.....	15.00 to 15.25
Lake Superior Coke, No. 3.....	14.50 to 14.75
Southern Basic.....	14.00 to 14.75

### Car Wheel and Malleable Irons.

Standard Southern Car Wheel, chilling grades.....	\$18.25 to \$18.75
Standard Southern Car Wheel, No. 2.....	17.25 to 17.75
Lake Superior Car Wheel and Malleable.....	18.50 to 19.00

**Plates and Bars.**—There has been no change in the price-list and business is rather quiet. We quote, f.o.b. Cincinnati: Iron Bars, in carload lots, 1.60c., with half extras; same in small lots, 1.80c., with full extras; Steel Bars, in carload lots, 1.15c., with half extras; Base Angles, in carload lots, 1.80c.; Plates,  $\frac{1}{4}$ -inch and heavier, 1.80c.; Sheets, No. 16, 2.50c.

**Old Material.**—Trading has been moderate on an unchanged basis, and the outlook is for quietness and no change in quotations. We quote dealers' buying prices, f.o.b. Cincinnati, as follows: No. 1 Wrought Railroad Scrap, per net ton, \$16; Cast Railroad Machine Scrap, \$12.25 to \$12.75; Iron Axles, \$18.75 to \$19; Iron Rails, \$16.75 to \$17.25; Steel Rails, rolling mill lengths, \$14.75 to \$15.25; short lengths, \$13.75 to \$14; Car Wheels, \$15.75 to \$16.25. All prices except No. 1 Wrought on the basis of gross tons.

## St. Louis.

Office of *The Iron Age*, 1206 Chemical Building, {  
St. Louis, May 20, 1901. }

**Pig Iron.**—There is but little change in the Pig Iron market. Dealers report a fair volume of business and a good demand. One firm report a sale of 500 tons during the past week. A prominent feature, however, is the indisposition to do anything in the way of buying, except when special inducements are made or the Iron is for early delivery. A number of foundries are short of Iron and will take hold as soon as favorable prices are offered. Prices remain steady, but reports are made of concessions on the part of some small Southern furnaces. We quote carload lots, f.o.b. St. Louis, as follows:

Southern, No. 1 Foundry.....	\$15.00 to \$15.25
Southern, No. 2 Foundry.....	14.50 to 14.75
Southern, No. 3 Foundry.....	14.00 to 14.25
Southern, No. 4 Foundry.....	13.50 to 13.75
No. 1 Soft.....	15.00 to 15.25
No. 2 Soft.....	14.50 to 14.75
Gray Forge.....	13.00 to 13.25

**Bar Iron.**—The general demand for Bar Iron is pretty much the same as reported for several weeks. Mills are sold up for some time ahead and prices are firmly maintained in consequence. Dealers will only quote prices

for indefinite delivery. Mills quote Iron and Steel Bars at 1.70c. to 1.75c., half extras, East St. Louis. Jobbers quote Iron Bars 1.95c. to 2c., Steel 2c. to 2.10c., full extras.

**Rails and Track Supplies.**—Manufacturers of Rails report a large demand, but the supply is very limited, and decline to contract for new business except for delivery next year. Light Rails continue in good demand, and Bolts, Nuts, Washers, &c., are moving quite freely. We quote: Splice Bars, 1.85c. to 1.90c.; Bolts, with Square Nuts, 2.50c. to 2.60c.; with Hexagon Nuts, 2.65c. to 2.75c.; Spikes, 1.90c. to 2c.

**Pig Lead.**—There is only a moderate demand for Pig Lead and inquiries are largely confined to carload lots. Sellers quote 4.22½c. to 4.25c., and the first named price would doubtless be shaded if the specification was a desirable one. Desilverized is quoted at 4.30c. to 4.32½c.

**Spelter.**—The market is quiet and without any features of interest. There are no sales of any moment recorded and the market is well represented by the quotation of 3.80c.

## Pittsburgh.

Office of *The Iron Age*, Hamilton Building, Pittsburgh, May 22, 1901.

(By Telegraph.)

**Pig Iron.**—There is hardly enough Bessemer Iron being sold to fix a price. However, it is intimated that the United States Steel Corporation may come in the market before long and buy a round lot of Iron for the second half. The furnaces still have plenty of shipping directions for Iron and are not pressing the market to sell; at the same time it is a fact that practically nothing has been done for the second half of the year. If the demand for Bessemer Iron falls off it is not unlikely that some of the Valley furnaces now running on Bessemer may change to Foundry, for which there is a good demand. Forge Iron for May and June is strong at \$14, Valley furnace. The Republic Iron & Steel Company have bought a round lot of Forge Iron for extended delivery on a conversion basis. Foundry Iron is in very active demand and prices are firm. No. 2 Foundry is firm at \$15 to \$15.25, f.o.b. Pittsburgh. We quote: Bessemer Iron, \$15.50 to \$15.75, at Valley furnace, or \$16.25 to \$16.50, Pittsburgh; Northern Forge is \$14, at furnace, or \$14.75, Pittsburgh; No. 1 Foundry is \$15.50 to \$15.75; No. 2, \$15 to \$15.25, and No. 3, \$14.50 to \$14.75, all f.o.b. Pittsburgh. Sales of small lots of Bessemer running from 50 tons up to 500 tons are reported at prices ranging from \$15.75 to \$16, at Valley furnace. On a round lot of Bessemer for forward shipment \$15.50 or better could be done.

**Billets.**—While there is not much Steel being sold the market is very firm and prompt. Billets are scarce. Several lots of Steel of 500 to 1000 tons have been sold at \$24, Valley, or \$24.90, Pittsburgh. Parties who bought Steel early in the year for delivery through first half and later are having trouble in getting deliveries, and numerous trips have been made to New York to try to get the Steel officials to hurry Steel forward. Bessemer Billets, 4 x 4 inch, are quoted at \$24, but Steel, prompt shipment, has sold at slightly higher prices. Sheet Bars are more plentiful and the price is anywhere from \$25 to \$27, depending on deliveries wanted. Basic Billets are from \$26 to \$28, depending on deliveries and carbons.

**Muck Bar.**—We quote standard grades at \$27 to \$27.50 delivered, Pittsburgh.

(By Mail.)

Any effect the recent flurry in the stock market might have had on the Iron trade has passed away and the situation, while quiet, is strong. Something of a waiting game seems to be going on between the mills and their customers. The trade do not seem disposed to place orders just now for third and fourth quarters, but are holding off awaiting developments. By this we do not mean that demand has stopped, or that the customary amount of orders are not coming in to the mills, but that they are not nearly so heavy as a month or

two ago. It is not believed that prices will be higher and the trade has adopted the idea that any change will be in the direction of lower prices. There is not likely to be much change in the situation between now and July 1, when the wage scale will come up for settlement. The Amalgamated Association is now in session in Milwaukee, going over the wage scales for conferences with the mills. The policy of the United States Steel Corporation will likely be to allow the presidents of their constituent companies to settle the scales for the individual plants as heretofore. There is no doubt but that the wage scales to be adopted by the Amalgamated Association in Milwaukee will contain demands for higher wages in nearly all lines of Iron and Steel. It is reported the Tin Plate works scale and the Sheet mill scale call for an advance of from 15 to 20 per cent.

**Structural Material.**—While most of the large jobs for this year have been placed, yet a good deal of tonnage is being placed. The American Bridge Company have received some large contracts lately, among these being the material for the new shops of the Lake Shore road at Collingwood, calling for 3000 tons. One of the constituent concerns in the American Bridge Company shipped in one month recently 7339 tons of material. Other contracts have been taken by the American Bridge Company and the Structural mills are about as full of work as they could be. There is no change in prices and we quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6 inch, 1.60c.; smaller sizes, 1.55c. to 1.60c.; Zees, 1.60c.; Tees, 1.65c.; Steel Bars, 1.40c. to 1.50c., half extras, at mill; Universal and Sheared Plates, 1.60c. All above prices are f.o.b. Pittsburgh.

**Plates.**—The Carnegie Steel Company are rolling this week at their Homestead Works some Plates for the new docks at Galveston, Texas. A good deal of tonnage in Plates is being placed, but not as heavy as some time ago. A few of the mills are catching up with their orders and are making better deliveries. We note a good demand for higher grades of Fire Box and other special grades of Plates. We quote: Tank quality, ¼-inch and heavier, 1.60c.; 3-16 inch, 1.65c.; under 3-16 inch and above No. 10, 1.70c.; Flange or Boiler Steel, 0.1c. advance over the base of Tank; Marine and Fire Box, American Boiler Manufacturers' Association specifications, 0.2c. advance over Tank; Still Bottom Steel, 0.3c. advance over Tank; Locomotive Fire Box Steel and equivalent specifications, 0.5c. advance over Tank, all f.o.b. Pittsburgh.

**Ferromanganese.**—We continue to quote 80 per cent. Ferro at \$58.50 in carload lots, delivered. It is stated that foreign Ferro is being offered in this market at lower prices.

**Rails.**—Most of the Rail mills are so crowded with work that they have been compelled to turn down tonnage. No large lots are being offered, and it is doubtful if any of the mills are in position to take on large contracts. We quote Standard Sections at \$28, at mill.

**Sheets.**—As indicating the scarcity of Sheets for prompt shipment we may state that No. 22 have sold at 3.10c. for prompt delivery. There is a continued heavy demand for Sheets, and the market is firm. We quote: No. 27 Black Sheets, box annealed, 3.20c. to 3.25c.; No. 28, 3.30c. to 3.35c. We are advised that contracts for Sheets for delivery three or four months ahead have been made at these prices. We quote Galvanized Sheets at 70 and 5 per cent. off in carload lots, maker's mill, and 70 and 10 per cent. off in large lots.

**Bars.**—Contracts are still being placed by Implement makers, and the tonnage taken from this trade in the past week or two has been very large. There is also a good demand for Bars from the general trade, but not as heavy as some time ago. The leading mills are filled up for the next two months or more, and not actively seeking tonnage. We are advised that prices are being firmly held. We quote Steel Bars in large lots at 1.40c. and 1.45c. to 1.50c. in small lots, full half extras at mill. For Open Hearth Steel Bars \$2 a ton advance is charged, and also extras on high carbons. Prices are f.o.b. Pittsburgh, with freight added, as per National Tube Com-



pany rate book. We quote Common Iron Bars at 1.45c. to 1.50c., half extras, Valley mill. Refined Iron Bars are quoted by the Valley mills at about \$2 per ton advance. We quote Hoops at 1.90c., base, for large lots and 2c. in small lots. Bands up to 12 gauge are sold on the Bar card and we quote at 1.45c.

**Tubular Goods.**—There is a heavy tonnage being placed in Pipe, and the mills are crowded to their utmost to get out tonnage fast enough. A great deal of material continues to be sent from the Pittsburgh district to the new oil fields in Texas. Jobbers are holding up prices better than for a long time. To the small trade in less than carloads prices are as follows:

Merchant Pipe.		Per cent.	Per cent.
		Black.	Galvd.
1/2 to 3/4 inch and 11 to 12 inch.....		61	48
3/4 to 10 inch.....		68 1/2	56
Casing, Random Lengths.			
	S. & S.	I. J.	
2 to 3 inch.....	58	53 1/2	
3 1/4 to 4 inch.....	63	59	
4 1/4 to 12 1/2 inch.....	65	61 1/2	
Casing, Cut Lengths.			
	S. & S.	I. J.	
2 to 3 inch.....	53 1/2	59	
3 1/4 to 4 inch.....	59	55	
4 1/4 to 12 1/2 inch.....	61 1/2	57 1/2	
Boiler Tubes.		Up to 22 feet.	
		Per cent.	
Steel.			
1 inch to 1 1/2 inch and 2 1/4 inch to 5 inch, inclusive....		65 1/2	
2 inch to 2 1/2 inch, inclusive.....		60	
6 inch and larger.....		59	
Iron.			
1 inch to 1 1/2 inch and 2 1/2 inch.....		43 1/2	
1 1/2 to 2 1/4 inch.....		43	
2 1/2 to 13 inch.....		53	

Prices made by the mills to the jobbers are from 5 to 10 per cent. lower than the above.

**Skelp.**—The market is very firm. We quote Grooved Iron and Steel Skelp at 1.75c. to 1.80c., and Sheared at 1.80c. to 1.85c. f.o.b. Pittsburgh. We may note that sales of Skelp are reported at slightly higher prices than these, where the mill is in position to make reasonably prompt delivery.

**Coke.**—There is not much demand for Coke, consumers being covered by contracts. Output last week was 33,218 tons, 19,796 ovens being active and 1652 idle. Shipments of Foundry Coke are very heavy, and a very satisfactory car supply is reported. We quote strictly Connellsville Furnace Coke at \$2 and Foundry at \$2.25 to \$2.50. Main Line Coke is being offered at lower prices.

## Birmingham.

BIRMINGHAM, ALA., May 21, 1901.

As happens every year when we are nearing June, the market gets saggy and trade very light. This year is no exception to this condition. There were no sales of any important lots reported. In some quarters a somewhat increased inquiry was reported, but it eventuated in but a small business. As we get further into the year it leaks out that some important sales have been made running into 1902. Quotations are as yet irregular. Some still report No. 2 Foundry at \$11.75, while there is no doubt that at \$11.25 most of the business was done. There were reports of sales at \$11, but no one was willing to confirm them by acknowledging the sales. Gray Forge is quoted at \$10.25, but there were sales at less. The truth is that no seller concerns himself much about competitors' prices. The result is a want of uniformity in values and one finds it difficult to get the true pulse of the market. There seems to be more demand from the agricultural implement makers than from any other source just now.

The reports concerning consolidations of some of the leading interests have been so positive and so persistent as to be annoying to leading officials. So it has been stated by those most interested and who are in a position to know that no negotiations are in progress and none are contemplated. While this is in all probability true, the rumors will not down. The most of them emanate from Wall street, and probably for the purpose of influencing the value of their stocks.

The demand for Steel is said to be better than the demand for Iron. For Axle Steel it is particularly good,

and the product furnished by the mill has been so increased as to reach now about 600 tons daily. Since the installation of the three Talbot-Fraser gas producers at the mill efficiency in working has been greatly increased and results are more and more satisfactory. There is now no complaint and everything is working very smoothly.

The Rail mill is being pushed rapidly to completion. Orders for round lots have already been tendered the mill. In one instance an order was offered to furnish the Rails for 300 miles of road. But the policy of the management is to avoid being tied up with large orders until the mill is in smooth running order and working satisfactorily. Orders for lots running from 3000 up to 20,000 tons have been frequent, but acceptance has been limited to very few of them. The prospects for a continuous large and prosperous business by the mill could not be better.

Some cabling has been going on about export business, and the prospects for the resumption of this trade are brighter. During the past week buyers and sellers were only 1 shilling apart in their views; and at the close of the week negotiations were still pending for important lots. It is very probable that some business will be accomplished this week.

The Tennessee Company closed with the Mexican Central Railroad the past week an important contract for Coal, covering 150,000 tons. Shipments are to be made by way of Pensacola and the deliveries extend throughout the year. The quality sold was "run of the mine," and while one cannot positively state the price paid, it is not a bad guess to put it at about \$1.20. The same company also received some contracts with railroads on the basis of last year's prices. Altogether their Coal contracts of last week will cover 400,000 tons. This year will show a large increase in the Coal business.

The Dimmick Pipe Works have also had an inning the past week, capturing an order from the city of Atlanta for the extension of their system of water works that amounted to over \$100,000. There was sharp competition in the bidding by rival interests for this order, and the fact that it came here is confirmatory of the claim of cheap production for this market.

There has been some apprehension on the score of labor troubles here, and it has been given out that the strikes just inaugurated in other sections would be extended to this district. We have had some little trouble, but it has not been general. Now there are mutterings which may crystallize into action. Nothing more unfortunate for the district could occur. Everything in the way of industrial development looks so encouraging here that any interruption to its progress would be a disaster that would affect all, because on it depends the entire community.

There are some deals in mineral and Coal lands of magnitude under negotiation which it would be premature to mention just yet. They may fail to mature to successful conclusions. But if successfully concluded it means the investment of a large amount of money and additional development.

## New York.

Office of *The Iron Age*, 232-238 William street,  
New York, May 23, 1901.

**Pig Iron.**—Generally speaking, the market is quiet. There has been some buying on the part of Pipe interests and more may follow. Practically nothing is being done in the export trade since prices in such markets as Manchester are about \$3 below our parity. Small lots are going to South America. We quote: Lehigh, Schuylkill and Virginia Irons, No. 1, \$16.50 to \$17.50; No. 2 X, \$15.40 to \$16; No. 2 Plain, \$14.25 to \$14.50; Gray Forge, \$14 to \$14.50; Tennessee and Alabama brands, No. 1 Foundry, \$16 to \$16.25; No. 2 Foundry, \$15 to \$15.50; No. 1 Soft, \$16 to \$16.25; No. 2 Soft, \$15 to \$15.50; No. 3 Foundry, \$14.50 to \$14.75; No. 4 Foundry, \$14.25 to \$14.50; Gray Forge, \$14.25 to \$14.50.

**Cast Iron Pipe.**—The Pipe shops are taking in a good deal of business all over the country, and the demand

for small lots is particularly active and urgent. It looks as though the tonnage this year would be exceptionally large. We continue to quote \$23 to \$23.50 per gross ton at tidewater.

**Steel Rails.**—The market is very quiet. There is some difficulty in placing small lots for prompt delivery, the mills being crowded. There is some demand for Relayers, and some business has been done. We quote \$28 for Standard Sections, \$32 to \$32.50 for Girder Rails, and \$22 to \$23 for Relayers. We quote Spikes, 1.80c. to 1.85c.; Splice Bars, 1.45c. to 1.50c.; Square Track Bolts, 2.35c. to 2.40c., and Hexagon Bolts, 2.45c. to 2.50c., at mill.

**Finished Iron and Steel.**—Some good contracts for buildings have been placed and others are pending. In fact, there is more work in the architects' offices coming out than is usual at this time of the year. There is a lively demand, too, for small lots. We quote as follows at tidewater: Beams, Channels and Zees, 1.75c. to 1.80c.; Angles, 1.75c. to 1.80c.; Tees, 1.80c. to 1.85c.; Bulb Angles and Deck Beams, 2c.; Sheared Steel Plates are 1.80c. to 1.85c. for Tank, 1.90c. to 1.95c. for Flange, 2c. to 2.05c. for Fire Box. Charcoal Iron Plates are held at 2.25c. for C. H. No. 1, 2.75c. for Flange, and 3.25c. for Fire Box. Refined Bars are 1.50c. to 1.60c.; Common Bars, 1.45c. to 1.50c.; Soft Steel Bars, 1.62½c. to 1.65c., and Hoops, 1.90c. to 2c., base, on dock.

## Metal Market.

Office of *The Iron Age*, 231-236 William street, New York, May 23, 1901.

**Pig Tin.**—There was a good deal of activity in speculative buying here during the week in sympathy with the bull movement in London, to which we referred last week. The market here since our last writing has advanced nearly 1½c. per lb., closing to-day at 27.50c. to 27.95c. for spot, 27.65c. to 28c. for May and 27.87½c. to 27.90c. for June to August. Of special interest to-day was the offering to sell 100 tons of spot, and take 100 tons of July at a premium of 5 points for the July over spot. This shows that spot is more than plentiful here, while in London there is still a discount on futures over spot. The London market during the week just closed has advanced £6, closing to-day £127 15s. for spot and £127 2s. 6d. for futures. The half monthly shipments from the Straits were cable on the 16th inst. as being 1285 tons, or 190 tons less than for the same period of last year. But with this news came the information on the same day that the steamship "Richmond Castle" left Singapore for New York with 850 tons aboard. This shipment is not included in the half monthly figures, so that actually the shipments for the half month are 2135 tons, or 660 tons more than during the same period of last year.

**Copper.**—This market was just as dull during the last week as was the London market. The principal producing interest still quotes prices at 17c. for spot, Lake, and 16½c. for Electrolytic and Casting. London is dull at £69 12s. 6d. for spot, and £70 2s. 6d. for futures. Best Selected remains unchanged at £75 15s. The exports from here during the first three weeks of this month show a total of 7282 tons, and it may be expected that they will run up to 10,000 tons by the end of this month. This would be about 2000 tons less than the figures for the month of May alone of last year. In certain producing circles much is being made of these increased shipments. In other quarters of the trade, however, it is stated that these shipments are to a great extent the execution of sales made some weeks ago, and to which reference was made in this column as being sold in Europe on a basis of 16½c. for Lake. While it is said in certain quarters that the largest producer of Lake is working harmoniously with the other large producing interest, parties in the trade state that this truth holds good as far as the American consumer is concerned. For European business, however, it is said they have their own price. There is little comment in the trade about the producers' returns for domestic production, and also regarding the European production. The important part

of the question of production seems to lie in the European figures. These show that the larger producers in Europe increased their output in April nearly 20 per cent. over the same month the previous year. Under date of April 12, 1901, Consul-General Guenther of Frankfort informs the State Department that prominent German Government officials and scientists, in discussing the different methods for destroying phylloxera on grapes, decided that the only known means of accomplishing the results was by the use of bisulphuret of carbon and petroleum. It is stated in the trade that this may eventually further reduce the consumption of Copper in Europe, as heretofore very large quantities of sulphate of Copper (blue vitriol containing 25 per cent. of Copper) were used in Italy, France and Germany for this purpose annually.

**Pig Lead.**—There is no change here. The American Smelting & Refining Company continue to quote 4.37½c. for Desilverized, New York, and 4.32½c., St. Louis. The London market is quoted £12 2s. 6d., which is equal to 2.57½c. in London. Business has been very slack.

**Spelter.**—This market is not changed, the ruling quotation still being 3.95c. to 4c. In London, however, the prices advanced 15 shillings, to £18, which is equal to 3.92½c. in London.

**Antimony.**—Is unchanged. Hallett's is quoted 8½c. to 9c., Hungarian 8½c. to 8¾c., and Cookson's 10¾c.

**Nickel.**—Lots not covered by yearly contract are not obtainable under 60c.

**Quicksilver.**—There is no change. Prices quoted here are \$51 per flask of 76½ pounds for lots of 50 flasks or more. The London market is unchanged at £9 2s. 6d.

**Tin Plate.**—The demand is fair, and prices are unchanged. The American Tin Plate Company continue to quote deliveries until October 1 on a basis of \$4.19 per box of Standard 100-lb. Cokes, f.o.b. New York, and \$4 per box f.o.b. mills.

John Stanton reports the Copper production in the United States and of the foreign reporting mines and United States exports as follows, in gross tons of 2240 lbs.:

	Reporting mines.	Outside sources.	Total U.S. product.	Product foreign mines.	U. S. exports.
First half 1895....	70,612	9,100	79,712	42,484	37,215
Second half 1895....	84,885	6,600	91,485	43,674	30,507
Total 1895.....	155,497	15,700	171,197	86,178	64,722
First half 1896....	94,180	7,200	101,380	42,255	58,216
Second half 1896....	95,314	7,200	102,514	43,941	67,287
Total 1896.....	189,494	14,400	203,894	86,196	125,503
First half 1897....	103,651	5,000	108,651	44,263	64,870
Second half 1897....	100,555	6,900	107,455	44,007	64,340
Total 1897.....	204,206	11,900	216,106	88,270	129,210
First half 1898....	112,687	7,800	120,487	40,880	68,284
Second half 1898....	103,535	10,250	113,785	43,674	76,831
Total 1898.....	216,222	18,050	234,272	84,554	145,115
First half 1899....	111,987	12,500	124,487	43,629	56,460
Second half 1899....	118,818	18,900	137,719	45,611	63,351
Total 1899.....	230,806	31,400	262,206	89,240	119,811
First half 1900....	114,177	20,400	134,577	43,153	90,747
Second half 1900....	113,810	20,400	134,104	46,278	69,335
Total 1900.....	227,987	40,800	268,681	89,431	160,082
January, 1901.....	19,279	3,400	22,679	5,910	10,003
February, 1901....	17,700	3,400	21,100	7,332	8,453
March, 1901.....	19,984	3,400	23,384	7,817	6,818
April, 1901.....	18,033	3,400	21,433	8,810	4,849

## President Schwab on the Ore Supply.

C. M. Schwab, president of the United States Steel Corporation, states that his testimony before the Federal Industrial Commission has been misunderstood. When asked how much ore the corporation controlled in the Lake Superior ore ranges, he stated that so far as could be estimated it amounted to 500,000,000 tons, and in reply to the question how long that supply could last, replied that at the present rate of consumption it would supply the company for 50 to 60 years. He did not pretend to intimate that this included any probable or possible future discoveries.

In the Circuit Court of Appeals in Philadelphia on May 17 was affirmed the finding of the Pittsburgh court in the suit of the Scully Steel & Iron Company against the Old Meadow Rolling Mill Company, to recover \$21,787, with interest, under contracts for the purchase and sale of a large quantity of Bessemer steel sheets at certain prices. The verdict was in favor of the Old Meadow Company for \$6,306.42.



## QUOTATIONS OF IRON STOCKS DURING THE WEEK ENDING MAY 22, 1901.

Cap'l Issued.	Thursday.	Friday.	Saturday.	Monday.	Tuesday.	Wednesday.	Closing quotations.	Sales.
\$10,000,000 Am. Bicycle Co., Com....	- 7	.....	.....	- 7	.....	.....	.....	200
20,000,000 Am. Bicycle Co., Pref....	.....	.....	.....	.....	.....	.....	.....	.....
10,000,000 Am. Bicycle Co., Bonds....	.....	-80	-80	-80½	.....	.....	.....	43,000
29,000,000 Am. Car & Foundry, Com.	23½-24½	24½-24½	24½-25	24½-25	24½-24½	24½-26½	25½	16,000
29,000,000 Am. Car & Fndry Pref.½.	77 -79	79 -79½	79½-79½	79½-80	79½-79½	80 -81½	80	6,400
7,500,000 Bethlehem Iron.....	-63	-63	-63	.....	.....	.....	.....	250
15,000,000 Bethlehem Steel½.....	23 -23½	22 -23½	22½-23	22 -22½	-22	- 22	.....	4,677
7,974,550 Cambria Iron, Phila.*.....	46½-47	.....	.....	.....	-46½	.....	.....	32
16,000,000 Cambria Steel**.....	21½-22	21½-22½	22½-23½	23½-23½	23½-23½	21½-23	21½	47,851
17,000,000 Colorado Fuel & Iron....	90 -92	91½-94½	94½-96	97 -98½	95 -95½	93½-94½	93½	7,500
24,410,900 Crucible Steel, Com.....	.....	.....	.....	.....	.....	.....	.....	.....
24,399,500 Crucible Steel, Pref.....	.....	.....	.....	.....	.....	.....	.....	.....
1,975,000 Diamond State Steel½.....	- 5½	- 6	- 6½	6 - 6½	- 5½	- 6½	.....	689
15,000,000 International Pump, Com.	37½-39½	39½-41	41 -41½	40½-41	-40½	39½-40½	39½	6,300
12,500,000 International Pump, Pref.	-81	-81	.....	.....	81½-82½	-82	82	1,200
11,000,000 International Silver.....	.....	- 6½	- 6½	.....	- 6½	6½- 6½	6½	1,000
5,000,000 Penna., Com., Phila.....	.....	-30	.....	35 -37½	35½-37	36 -36½	37	4,100
1,500,000 Penna., Pref., Phila.....	.....	.....	.....	.....	.....	.....	.....	.....
12,500,000 Pressed Steel, Com.....	-43½	43 -44½	44½-44½	44 -44½	-44½	44 -45	45	8,500
12,500,000 Pressed Steel, Pref.....	84½-84½	84½-86½	.....	.....	.....	.....	.....	2,000
27,191,000 Repub. Iron & Steel, Com.	17½-17½	18 -19½	19½-19½	18½-19½	18½-19	18½-19	18½	11,600
20,306,900 Repub. Iron & Steel, Pref.	72 -73	74 -75	74½-75	73½-75	73 -74	74½-74½	74½	4,700
7,500,000 Sloss-Sheffield S. & I., Com.	.....	-35½	36 -36½	.....	32½-34	34½-35	35	1,800
6,700,000 Sloss-Sheffield S.&I., Pref.½	81½-83½	.....	.....	.....	.....	.....	.....	300
20,000,000 Tennessee Coal & Iron....	53½-54½	55½-58	57½-58½	56½-57½	55½-56½	56 -56½	56½	8,200
1,500,000 Tidewater Steel½.....	- 7	.....	- 7	.....	.....	.....	.....	200
425,000,000 U. S. Steel Co., Com.½.....	42½-44	43½-45	44½-45½	43½-45½	43½-44½	44½-44½	44½	228,500
425,000,000 U. S. Steel Co., Pref.½.....	90½-92	91½-94	93½-94½	92½-94½	92½-93½	92½-93½	93½	161,500
1,500,000 Warwick I. & S.½.....	.....	.....	.....	.....	- 7	.....	.....	15

Preferred stocks 7 % cumulative unless otherwise stated. ½ % Non-Cu. ½ Par \$10. ½ Par \$50. \$1 paid in. ½ Authorized Capital \$350,000,000 Common; \$555,000,000 Preferred; \* Par \$50. \*\* \$10.50 per share paid in. + ½ % guaranteed by Beth. Steel Co. Late Philadelphia sales by telegraph.

**Bonded Indebtedness:** American Bicycle Co., \$10,000,000 sinking fund gold debentures 5 %; Cambria Iron Co., \$2,000,000 6 % debenture 20-year bonds, 1917, payable option 5 years, assumed by Cambria Steel Co.; Diamond State Steel Co., property leased from Diamond State Steel Co. at 4 % on \$1,000,000, \$6.25 on Steel stock paid in, \$1.25 called for June 1st, total capital \$3,000,000; Tennessee C. I. & R. R. Co., \$3,867,000 6 %, \$1,114,000 7 %, \$1,000,000 7 % cu. pref.; Pennsylvania Steel, \$1,000,000 5 % Steelton 1st, 1917, \$2,000,000 5 % Sparrow's Point 1st, 1922, \$4,000,000 consolidated, both plants; Bethlehem Iron, \$1,351,000 5 % maturing 1907, interest and principal guaranteed by Bethlehem Steel Co.; Republic Iron & Steel, none; Warwick Iron & Steel, none; Colorado Fuel & Iron Co., Col. Fuel Co. Gen. Mort. 6 % \$80,000, Col. Coal & Iron Co. Mort., 6 % \$2,810,000, Col. Fuel & Iron Gen. Mort. 5 % \$2,308,000, also outstanding \$3,000,000 preferred stock; Sloss-Sheffield St. & I. Co., Sloss I. & S. first mortgage 6 %, \$2,000,000, Sloss I. & S. general mortgage 4½ %, \$2,000,000. U. S. Steel Corporation \$304,000,000 5 % gold bonds, also Am. S. & W. Co. \$130,650 Federal Steel Co. \$9,822,000 Illinois 5 %, \$7,417,000 E. J. & E. R. R. 5 %, \$1,600,000 Johnson 6 %, \$6,732,000 D. & I. R. R. R. 5 %, \$1,000,000 2d D. & I. R. R. R. 6 %, \$10,000 land grant D. & I. R. R. R. 5 %; National Steel \$2,561,000 6 %.

## Iron and Industrial Stocks.

Early in the week under review the market gathered strength and since that time the steel stocks have been steady, with only minor fluctuations. The volume of trading has fallen off considerably in all directions.

	Bid.	Asked.
E. W. Bliss, common.....	138	.....
E. W. Bliss, preferred.....	130	140
Cramp's Shipyard stock.....	83	85½
Dominion Iron & Steel Company.....	34	.....
Empire Iron & Steel, common.....	6	8
Empire Iron & Steel, preferred.....	40	45
National Enam. & St., common.....	21	22
National Enam. & St., preferred.....	82½	85
New Haven.....	4½	5
Otis Elevator, common.....	30	31
Otis Elevator, preferred.....	90	92
Pratt & Whitney, preferred.....	85	90
U. S. Cast Iron Pipe Company, common.....	8½	9
U. S. Cast Iron Pipe Company, preferred.....	40	40½
U. S. Projectile.....	115	.....
Y. C. I. & C., stock.....	8	9
Y. C. I. & C., bonds.....	51	53
H. R. Worthington, preferred.....	110	114

**The International Steam Pump Company.**—The International Steam Pump Company have issued the following statement:

Cash on hand May 15, 1901.....	\$741,827.81
Cash on hand April 10, 1901.....	712,972.82
Net gain since April 10, 1901.....	\$28,854.99
Dividends paid.....	202,750.00

Actual gain for 35 days.....\$231,604.99

Making a comparison of the liquid assets of the concern with April 30, 1900, the following results are obtained:

	1901.	1900.	Changes.
Accounts and bills receivable.....	\$2,758,787	\$2,528,358 Inc.	\$230,429
Cash on hand.....	816,232	397,993 Inc.	418,239
Total.....	\$3,575,019	\$2,926,351 Inc.	\$648,768
Bills payable.....	.....	550,000 Dec.	550,000

Surplus.....\$3,575,019 \$2,376,351 Inc. \$1,198,668

The annual meeting of the stockholders of the International Steam Pump Company will be held at the office of the company, No. 243 Washington street, Jersey City, on Tuesday, June 11, at 2 o'clock p. m. The transfer books will close May 20 and reopen June 12.

The directors of the American Linseed Company formally announce that they have made what they consider a most desirable arrangement for an exchange of the stock of the company for the stock of the Union Lead & Oil Company. The stock of the Union Company, including that necessary to acquire all the capital stock of the American Linseed Company, will be \$17,000,000, all common shares. Under the agreement reached, each share of the preferred stock of the American Linseed Company will receive \$48 in the stock of the Union Lead & Oil Company. Each share of American Linseed common stock will receive \$18 in the stock of the Union Company. Two-thirds of each class of stock of the American Linseed Company must be deposited in order to bind the agreement on the Union Company.

The Cambria Steel Company are reported to be working on a plan to exchange full paid stock for their present issue.

A second call of 25 per cent. has been made on the Pennsylvania Steel Company's underwriting syndicate, payable June 3.

The treasurer's report of the National Fireproofing Company shows: Assets—Accounts and bills receivable, \$262,306.06; stocks and bonds in other companies, \$15,625; stock in hand, \$150,000; money at interest, \$100,000; cash on hand, \$131,156.68; total, \$659,087.74. Liabilities—Accounts and bills payable, \$141,034.16; balance, \$518,053.58.

**Dividends.**—The St. Joseph Lead Company have declared the regular quarterly dividend of 1½ per cent., payable June 20.

The Park Steel Company have declared the regular quarterly dividend of 1¼ per cent. on their preferred stock, payable June 1.

The National Tube Company have declared the regular dividend of 1¼ per cent. on their preferred stock, payable July 1. Books close June 20 and reopen July 1.

The Boston offices of the Eastern Forge Company of Massachusetts have been removed from rooms 78 and 79 Mason Building, 70 Kilby street, to room 84 in the same building.

## The Philadelphia Machinery Market.

Office of *The Iron Age*, Forrest Building,  
Philadelphia, Pa., May 20, 1901.

The Philadelphia machinery market still continues active, and no diminution from last month's volume of business can be noticed. Some few manufacturers, however, are not more than comfortably busy at this time, while others are having a period of much greater activity than they had during the earlier months of the year, and are now being taxed to make early deliveries.

Inquiries are reported more numerous and of good tone and generally lead up to business without much delay. The last week may, however, be said to be an exception, as the threatened labor troubles have been looked upon as a large factor in the question of deliveries, and although no great difficulty is expected by the manufacturer, there is unquestionably some hesitancy on the part of both buyer and seller in making specific settlements as regards delivery.

Foreign demand has developed slightly in some lines, but no particular encouragement is offered under ruling conditions.

The various foundries still keep comfortably busy and would no doubt be congested were it not that out of town foundries are now taking on a great deal of work for city delivery.

No change is noticeable in the demand for heavy machine tools, compression machinery, &c., and nearly all the shops are busy.

Owing to the more or less general decline in the demand for textile goods, the demand for this class of machinery has fallen off materially. This condition, however, is not expected to continue a great while, and will no doubt relax with the movement of the stocks of materials on hand at the mills.

Trade in the smaller machine tools has increased and manufacturers are in many cases being pushed to make deliveries.

Inquiries and sales among the manufacturers and dealers of the smaller engines, boilers and general supply trade have been numerous, and good sales have been made. This trade generally is in a very satisfactory condition.

Prices are generally firm and unchanged. It is said, however, that not so large premiums are being required for quick deliveries in certain lines.

Thomas H. Dallett & Co. have had a very busy month. Inquiries have been of good volume and a number of satisfactory orders have been taken. Among recent deliveries may be noted a number of stone surfacing machines, shipments of which have been made to Broth Bros. at Rockland, Maine, and Waterford, Conn.; Norcross Brothers, Stony Creek, Conn., and John Hagan, Philadelphia. Shipment of one of their large duplex drills has also been made for export to Germany.

The Nazel Machine Works have made numerous deliveries of their new portable drill to local parties, and have received orders for a number of special machines for creasing pasteboard boxes.

The Energy Elevator Company, manufacturers of various types of elevators, have been very busy. Inquiries are of good volume, and a large number of orders have been taken, four of which have been received from St. Louis, Mo., and two from Baltimore, Md. Shipments of elevators are being made to North Lubeck, Maine; Urbana, Ohio; St. Louis, Mo., and to several points in Wisconsin. A large amount of local work is also under construction.

The Philadelphia Machine Tool Company report inquiries plentiful and the resultant orders satisfactory, all parts of their plant being operated to their full capacity. Recent shipments include one No. 4 geared press for Boston, Mass., delivery, and a 600,000-pound chain testing machine for Lebanon, Pa., parties.

The Pedrick & Ayer Company, manufacturers of machine tools, pneumatic compression machinery, &c., are being taxed to their utmost capacity on a general line of tools, &c., and all departments are being operated on full time. Inquiries and orders are very satisfactory, and the trade outlook is considered excellent. Recent ship-

ments include a large electrically driven air compressor for export to St. Petersburg, Russia, and two heavy portable pneumatic riveters for the Imperial Steel Works of Japan. Domestic deliveries include shipments to various parts of the United States.

The Franklin Machine Works, Twelfth and Hamilton streets, have added a line of machine tools to those already manufactured by them. This line will include cold saw cutting off machines, boring, slotting and milling machines, planers, drills, &c., for which they are now prepared to furnish details and estimates.

The Philadelphia Pneumatic Tool Company have received a number of the new tools purchased for the equipment of their enlarged plant, and the company's capacity has been increased over 100 per cent. Foreign demand for their tools still continues active, and the home trade has materially increased. All departments of the plant are being operated to their utmost capacity.

Dienelt & Elsenhardt, manufacturers of hydraulic jacks, dead stroke hammers, &c., continue active in all departments. Inquiries have been particularly numerous and the prospects of future trade very satisfactory. Orders for several hammers and a number of jacks have been received in the past week and numerous shipments have been made to local and other parties.

Trade with Alfred Box & Co., manufacturers of electric cranes, hoists, &c., continues undiminished in volume. Inquiries are plentiful and several very desirable orders for cranes are practically closed, while a number of others are in sight. Among recent deliveries was a 15-ton electric crane for the Allison Mfg. Company, Philadelphia.

The Philadelphia Roll & Machine Company report trade in a very satisfactory condition, the roll department of the plant being exceptionally busy. Inquiries and orders are numerous and a number of orders have been placed on the books, among which may be noted a Tropenas converter for Wm. Wharton, Jr., & Co., Incorporated, and a converter for Benj. Atha & Co., Newark, N. J. Shipments of rolls have been made to the Pennsylvania, Bethlehem and Maryland steel companies, Pencoyd Iron Works, and to the Pittsburgh district. Additional rolling mill machinery is also being built for the Midvale Steel Company, Philadelphia.

The Harrison Safety Boiler Works continue very busy on a general line of heaters and separators, &c. Inquiries are voluminous and the prospects for continued trade satisfactory. Some additional machinery has recently been installed and further improvements in the foundry are contemplated.

The Southwark Foundry & Machine Company continue very busy in all departments of the plant. Inquiries and orders for general machinery are reported satisfactory, as also is the business in Weiss condensers, a number of which are now under construction.

The American Pulley Company, manufacturers of all wrought steel pulleys, report a very favorable condition of trade. Inquiries and orders have increased from domestic sources and more than equalize any falling off of foreign business. All parts of their plant are running full time and general deliveries have been heavy; car-load shipments are now being made to supply the demand in the Middle and Far West.

The Link-Belt Engineering Company are busy in all departments; general orders have been quite satisfactory and inquiries are numerous. During some portions of the month they have been compelled to work overtime to meet the heavy demands for their output. One order recently finished and which is now being erected was a complete conveyor system for the handling of materials at the plant of the Natural Food Company of Niagara Falls, N. Y.

The Tabor Mfg. Company continue very active. Inquiries are voluminous and the resultant orders satisfactory. Considerable additional machinery has been recently installed and the former capacity of this plant has been more than doubled. Foreign demand continues good, and a number of molding machines of the split pattern type have been shipped to England and Germany. Thirty machines of various types have been shipped to the General Electric Company, Schenectady.



N. Y., and orders for a number more are still on the books. Numerous shipments to other points have also been made.

The usual activity is being maintained at the Baldwin Locomotive Works, and all parts of the extensive plant are being operated to their best capacity. Inquiries and orders have been plentiful, especially from the home field, while there is little change shown in the foreign demand. The output of the plant has been increased to 30 engines per week, which average it is hoped by the management to maintain throughout the year. In order to further facilitate the work of the machine repair shop the Baldwin Locomotive Works is erecting an additional story, 195 x 49 feet, on the present shop. This improvement will cost about \$25,000. Among recent shipments may be noted two ten-wheel freight engines for the Sombrol Railway of Brazil, and two engines for passenger and freight service were shipped via line steamer to Korea for the Seoul Chemulpo Railway. One day's shipment last week included seven engines, two for the Union Pacific, two for the Baltimore & Ohio, two of the F three type mogul freight engines for the Pennsylvania Railroad, and one for the Chicago & Alton Railroad; and the next day's deliveries numbered eight locomotives.

The Wm. Cramp Ship & Engine Building Company are still very busy in all departments of their plant. On the 18th inst. the steamship "Arapahoe," building for the Clyde Line, was successfully launched. The "Arapahoe" is the sister ship to the "Apache," which was launched on March 30, and is intended for service between New York, Charleston, S. C., and Jacksonville. She is 303 feet long, beam 46 feet, and has a depth of 30 feet. According to the contract the "Arapahoe" is to make a speed of 15 knots an hour. Her freight carrying capacity is 3000 tons, and accommodations are provided for 200 passengers.

Continued activity is to be noted at the yards of the Neafie & Levy Ship & Engine Building Company. Work is progressing favorably, and one at least of the torpedo boat destroyers now building for the United States Government will be ready for launching in a month or six weeks. The construction of the United States cruiser "Denver" is also progressing very satisfactorily. On the 18th inst. the Neafie & Levy Company successfully launched the steamboat "Quaker City," a sister boat to the "City of Trenton," which was launched a short time ago. The "Quaker City," which is being built for the Philadelphia & Wilmington Steamboat Company, will ply between Philadelphia and Trenton, and has been designed for speed in the more shallow waters. She is 162 feet long, 32 feet beam and 33 feet guard, and is equipped with triple expansion engines and twin screws, and when loaded will draw less than 5 feet of water.

The Barr Pumping Engine Company continue very busy. Among recent orders may be mentioned one 15,000,000 gallon, vertical triple expansion pumping engine, for the city of Trenton, N. J., and one 4,000,000-gallon vertical cross compound pumping engine for the city of Kenosha, Wis. The Barr Pumping Engine Company now have their plans completed for the extensive improvements to their plant which have been previously mentioned in these columns. The new plant will include a machine shop, 50 x 250 feet, three stories high; an erecting shop, 80 x 130 feet and 60 feet high, and a three-story office building. The present machine and erecting shops will be converted into an iron and brass foundry. All these buildings are to be equipped with the most modern appliances, cranes, &c., and every facility utilized for the best and economical handling of materials.

The Ritter-Conley Mfg. Company, Pittsburgh, builders of iron and steel structural work of all kinds, have just taken additional contracts for large oil tanks to go to the new oil fields, at Beaumont, Texas. From 3000 to 4000 tons of plates will be used in the building of these tanks, all of which will be furnished by Pittsburgh mills. Tanks will also be built by the Ritter-Conley people at other places and thousands of tons of plates will be required.

## The New York Machinery Market.

Office of *The Iron Age*, 233-235 William street.  
New York, May 22, 1901.

Business was to a large extent at a standstill during the last week owing to the labor differences existing at the various shops throughout the country. All eyes were turned upon the shop and every one was anxious to know how the others were affected. With the attention of the entire country directed upon the machine shops, it was but natural that inquiry fell off to a very considerable extent. No transactions of importance were reported. A report of the strike situation is printed in another column.

One of the most interesting topics of the week was that it has been decided to settle upon the purchase of the machine tools which are to be installed at the new Elizabethport shops of the Central Railroad of New Jersey. As we have previously stated, report had it that the contract for the entire equipment will be given to Manning, Maxwell & Moore, who will act as brokers in supplying the tools desired. This contract is now ready for signature.

We are informed by J. D. Beardsley, general manager of the Louisiana Northwestern Railway Company, that the shops of the company at Gibsland, La., are soon to be enlarged and that a quantity of machine tools will be among the purchases.

Further purchases have been made by the Weston Electrical Instrument Company of Waverly, N. J., of machine tools to be installed in their new shop.

It is announced that plans are being prepared for a large addition to be built to the plant of the George V. Cresson Company of Philadelphia. The new building is to be used as a machine shop, and will be equipped with a complement of the latest machine tools. The specifications for the heating apparatus, power plant and lighting plant are completed.

McClave, Hamilton & Rimmer of 85 Liberty street have received an order for three 100 horse-power Ridgeway high speed engines to be direct connected to Westinghouse dynamos, and installed in the new building of the naval branch of the Brooklyn Y. M. C. A. They also received an order for a 160 horse-power Ridgeway engine direct connected to a 100 kw. Ridgeway generator from the Cedar Cliff Silk Company of Haledon, N. J., who are building a large addition to their plant.

The Ames Iron Works of 85 Liberty street have received an order from Boorum, Pease & Co. of Brooklyn for two 100 horse-power high speed engines to be direct connected to Bullock generators. Another order received by this company was for a 350 horse-power engine direct connected to a Bullock generator. It was from the San Juan Electric Light & Power Company of San Juan, Porto Rico.

A large order for milling machines is about to be closed by the Automobile Company of America of Marion, N. J., who are about to build an extensive addition to their plant, and are purchasing the machinery equipment.

We are informed on good authority that the new Allis-Chalmers Company have decided to build a large plant on the Atlantic Coast.

The Standard Air Brake Company of Jersey City have completed their scheme of reorganization and will now hurry their plans for a new factory. The reorganized company are to be known as the Standard Traction Brake Company. The capital of the company is \$100,000. The incorporators are Herman Westinghouse, Edwin M. Herr and Robert S. Green.

The Browning Engineering Company of Cleveland, Ohio, are inquiring for an open side planer and three lathes of 28, 30 and 32 inches swing respectively.

The Devere Electric Company of Cincinnati, Ohio, are looking about for an equipment of machine tools for a new shop which they will erect.

D. Bopp of Libitz, Pa., is inquiring for a machinery equipment for making tin boxes.

It is stated in the trade that the municipality of Canton, N. Y., intends purchasing a 1,000,000-gallon pump-

ing engine next month. L. R. Smith, the water works engineer, is in charge of the work.

Purchases are being made by the Standard Metal Mfg. Company of 53 New Jersey Railroad avenue, Newark, N. J., of machinery for equipping a new plant. The company intend doing sheet metal stamping, electro plating, buffing and polishing, japanning and die making. L. L. Terhune, who has for a number of years been the superintendent of the Tea Tray Company of Newark, N. J., is the president of the company.

The American Machinery & Export Company, commission merchants, 15 Cortlandt street, New York City, have bought the Cooke Machinery Company of New York City, and Mr. R. H. Richards, for a number of years identified with the latter concern, has been made vice-president and general manager of the American Machinery & Export Company.

## OBITUARY.

### NOTES.

NICHOLAS BRAYER, president of the Co-operative Foundry Company of Rochester, N. Y., died on May 11 at his home in that city. Mr. Brayer was born 72 years ago in France. In 1839 he came with his parents to this country, and early in life learned the trade of iron molding. In 1867, with others, he established the Co-operative Foundry Company at Rochester, of which corporation he had for many years been the president.

HENRY K. BAKER, president of the Springfield Foundry Company, Springfield, Mass., died suddenly from heart failure on May 19.

HENRY B. CALDWELL, senior member of the firm of Caldwell Brothers, wholesale dealers in machinery and manufacturers' agents, at Tacoma, Wash., died on May 10 at the Fannie Paddock Hospital, in that city, after an operation for appendicitis. He was born in Philadelphia 39 years ago, and in 1883 went to Tacoma, where he engaged in business.

HERMAN BAHLMANN, president of the Kruse & Bahlmann Hardware Company, Cincinnati, Ohio, died on the 12th inst. at Coronado Beach, Cal., where he had gone to restore his health. Mr. Bahlmann was born in Warendorf, Germany, April 2, 1848. At the age of 15 he emigrated to the United States and almost immediately became apprenticed to the firm of Kruse & Bahlmann, continuing in the capacity of apprentice, clerk and traveling salesman until the death of his brother, Albert Bahlmann, in 1874, at which time he was admitted to a partnership in the firm, retaining his interest as partner until the concern became an incorporated company, in 1889. In 1890, upon the death of Louis Kruse, president of the recently organized corporation, Mr. Bahlmann was elected to fill the vacancy.

**The National Steel Company.**—PITTSBURGH, PA., May 22, 1901.—(By Telegraph.)—The offices of the National Steel Company will be removed from New York to Youngstown, Ohio. Temporary offices have been secured in the old Caleb Wick homestead, at Youngstown, but a new five-story building is to be erected as soon as possible, the National Steel Company having leased it.

The torpedo boat "Biddle," built for the United States Navy, was successfully launched from the Bath Iron Works, Bath, Maine, on Saturday. The "Biddle" is a sister torpedo boat of the "Bagley" and the "Barney." Each showed speed more than a knot in excess of the 28 knots required by contract. The "Biddle" cost \$161,000.

The pattern makers at Youngstown, Ohio, have been included in the order giving the machinists nine hours per day instead of ten for same pay. The rule went into effect Monday, May 20. The molders' demand for a nine-hour day will probably be granted June 1.

At the settlement of the sheet workers' wage scale last week it was found that the men were not entitled to any advance in wages for May and June.

## PERSONAL.

A dispatch from Edinburgh, Scotland, says that Andrew Carnegie has given £2,000,000 to provide education at the Edinburgh, Glasgow, St. Andrews and Aberdeen universities for Scottish students only. A trust will be created to administer the fund.

Theo. W. Gunn has accepted a position as manager of the office of the Steamobile Company of America, at Keene, N. H.

S. N. Bradshaw, former superintendent of the Midland Steel Company, Muncie, Ind., will be superintendent of the National Rolling Mill Company, now constructing a merchant bar mill at Hartford City, Ind., which is expected to be in operation by July 1.

Robert W. Hunt of the Robert W. Hunt & Co. Inspection Bureau, Chicago, arrived in New York from abroad on the steamship "Oceanic" last Thursday.

A. F. Allen has been appointed secretary of the American Steel & Wire Company, Chicago, to succeed C. S. Roberts, resigned. Mr. Allen was formerly assistant treasurer.

Charles B. Brewer, superintending constructor of the United States Navy, has been transferred from Sparrow's Point, Md., to Newport News, Va.

John E. Stead of Middlesbrough, England, a famous metallurgist and chemist, has been awarded the Bessemer medal by the Iron and Steel Institute.

Frank M. Leavitt, for many years chief engineer of the E. W. Bliss Company, Brooklyn, N. Y., has severed that connection in order to establish himself as consulting engineer, with headquarters at 258 Broadway, New York.

W. P. De Armit, president and general manager of the New York & Cleveland Gas Coal Company, at Pittsburgh, one of the constituent interests of the Pittsburgh Coal Company, has resigned from that position, and will give his entire time to the management of Empire Coal Company, recently organized. Thos. D. De Armit, vice-president of the same company, has also resigned. W. P. De Armit has been with the New York & Cleveland Gas Coal Company for 28 years, and is extremely well known in the Pittsburgh coal business.

Jesse L. Law, who is one of the best known men in the New York machine tool trade and who for a number of years was in charge of the New York sales department of the Niles Tool Works Company, is now an "appraiser of machinery and tools," with headquarters at 459 Van Buren street, Brooklyn, N. Y. He has recently fixed the valuation on several plants which have been sold and is doing considerable work for the insurance companies.

At a meeting of the Board of Directors of the Compressed Air Company of New York, held recently, Julius E. French of the A. French Spring Company was elected a director, and Willis E. Gray, formerly general superintendent of the Chicago & Alton Railway Company, was chosen second vice-president.

W. K. Chapman of the firm of John Keep & Sons, iron and steel importers, of Sydney, New South Wales, has been visiting some of the large plants in and near Pittsburgh. Mr. Chapman sails for Australia from San Francisco on May 29.

Andrew Carnegie has made an offer to the Lord Provost of Glasgow, Scotland, of the sum of \$500,000 for the establishment of branch libraries in that city.

Fayette R. Plumb was elected president of the Manufacturers' Club of Philadelphia at their annual meeting on May 20, and John Birkenbine and Cyrus Borgner were elected vice-presidents.

G. E. Macklin has been made general manager of the Pressed Steel Car Company, at Pittsburgh, succeeding H. G. Shellenberger, resigned. Mr. Macklin was formerly assistant general sales agent, with headquarters in New York City.

William Davies, formerly secretary and treasurer of the Anniston Rolling Mill Company, Anniston, Ala., has



been elected vice-president and general manager of the concern, his former place being filled by C. P. Burgess of Birmingham, Ala.

P. G. Shook, formerly assistant superintendent of the Ensley, Ala., steel plant of the Tennessee Coal, Iron & Railroad Company, and John Fletcher, former assistant secretary of the same company, have opened an iron broker's office in Birmingham, Tenn.

William H. Morris has resigned the superintendency of the Cambria Steel Company's mines, to take charge of the mining operations of the Merchants' Coal Company, at Jenners, Somerset County, Pa.

H. L. Geissel has severed his connection with the Philadelphia Commercial Museum to connect himself with *Mining and Metallurgy* of New York.

N. Corwith, sales agent of the American Smelting & Refining Company, Chicago, has resigned, to take effect June 1. The general offices of the company are to be consolidated in New York, but Mr. Corwith's large private interests influenced him to resign in order to remain in Chicago. The name of Corwith has been prominently identified with the American lead trade for many years, but the connection will now cease.

Charles Wright, superintendent of the Aliquippa works of the Crucible Steel Company of America, has been transferred to Pittsburgh headquarters in charge of a department.

Samuel Jackson has been appointed master mechanic of the Valley mill of the Republic Iron & Steel Company at Youngstown. He succeeds Jacob M. Farris, who goes with the Youngstown Iron, Sheet & Tube Company.

Henry Butler, son of J. G. Butler, the iron manufacturer, at Youngstown, Ohio, is now connected with the Youngstown Iron, Sheet & Tube Company.

H. A. Higgins, the general manager of the Standard Tool Company of Cleveland, Ohio, sailed for England May 15, to visit the foreign representatives of his company in England, France, Germany, Russia and Scandinavia.

J. J. Charles of Hibbard, Spencer, Bartlett & Co. sailed for Europe from New York on Saturday last for a brief pleasure trip.

Frank L. Clark, general manager of the mills of the American Steel Hoop Company, at Youngstown, Ohio, has resigned.

It was announced this week that the large tract of marsh land lying between Jersey City and Newark, N. J., known as the Newark or Hackensack meadows, had been purchased by David Mayer of New York for a syndicate headed by J. Pierpont Morgan, for something like \$3,000,000. The Newark Meadow has a water front extending a mile on Newark Bay on the south and several miles on both the Passaic and the Hackensack rivers, all regarded as navigable waters and approached by the Kill von Kull, a strait from  $\frac{1}{2}$  mile to a mile wide. Report has it that the property is desired for its large water front and docking facilities and that it will be developed into a great steamship and wharfage system.

The four masted steel ship "Acme" was launched from the shipyard of Arthur Sewall & Co., at Bath, Maine, on Tuesday. She is specially designed for oil carrying and has a capacity of 1,500,000 gallons. The "Acme" is built on the same lines as the ship "Astral."

The Universal Company, manufacturers of gasoline gas lamps and railroad bicycle attachments, have removed from 205 Lake street to 100 Lake street, corner of Dearborn street, Chicago. They have secured larger quarters, and will devote more time to the manufacture of the Universal railway bicycle attachment. This is a rigging, consisting of three flanged wheels in Model A, and one flanged wheel in Model B, to be connected by braces with an ordinary bicycle, enabling its use on railroad tracks. The wheels of the bicycle rest on the top of one rail and the rigging keeps them in that position.

## AMONG THE HARDWARE TRADE.

Jos. F. Ochsner, Nauvoo, Ill., has disposed of that part of his business covering Hardware, Tinware and Stoves, to N. J. Reimbold & Son, to whom he has rented one of his store rooms. Mr. Ochsner will continue in the Agricultural Implement, Buggy, Vehicle and Bicycle business.

M. N. Jordan & Co., Tipton, Iowa, have sold out their Hardware stock, but will continue in the Implement, Machinery and Carriage business.

The Hardware store of Baxter & Son, Plainview, Neb., was recently burned out. The firm do not expect to rebuild.

O. J. Colman, Utica, Neb., has disposed of his Hardware, Stove and Sporting Goods business to J. H. Chain, who will make improvements in the store to bring it up to date.

E. S. Martin has purchased a half interest in the T. J. Coughlin Hardware Company, Topeka, Kan., and the style has been changed to Coughlin-Martin Hardware Company.

Samuel M. Brown is successor to Brown & Wright, at Davenport, Iowa.

Fleming & Farmer are now conducting the business formerly carried on under the style of Fleming, Mockley & Farmer, Perry, O. T.

Hildebrand & Diehl, Glen Rock, Pa., have been succeeded by the Plano Hardware Company.

H. G. & F. W. Tyler have purchased the Hardware and Implement business at Simpson, Minn., formerly carried on by S. H. Brown.

Frank B. Ford has bought the Hardware, Stove and Farm Implement business of I. N. Savage, Berrien Springs, Mich., and will continue at the old stand.

Cogdill & Spencer have succeeded D. B. Cogdill in the retail Hardware, Stove, Agricultural Implement, Harness, Wagon and Buggy business in De Kalb, Mo.

Reed & Carter, Hardware, Stove and Farm Implement merchants, Hillisburg, Ind., have been succeeded by J. A. Carter.

Quigg & Beringer, dealers in Shelf and Heavy Hardware and Farm Implements, Purcell, I. T., have dissolved, A. R. Quigg retiring from the firm. Mr. Beringer will continue at the old stand.

John McVoy & Co., 21 to 23 Michigan street, Chicago, dealers in Galvanized Iron and Sheet Steel, are about to add a complete stock of Tin Plate, all kinds of Corrugated Roofing, Conductor Pipe and Eave Troughs, and have under consideration the erection of a brick warehouse, 80 x 100 feet, adjoining their present location.

B. F. Crain, senior member of the B. F. Crain Hardware Company, Tidluote, Pa., died suddenly of heart disease on the 4th inst. In consequence the business of the company, under advice from their attorney, is being closed up as quickly as possible. All indebtedness will be paid by Robert F. Glenn, administrator of the B. F. Crain estate.

William A. Fox has just opened up in Knox, N. D., as dealer in Shelf and Heavy Hardware, Stoves and Tinware, Sporting Goods, Harness and furniture.

M. A. McCarthy has purchased the Hardware, Stove and Tinware business formerly conducted by C. F. Garison, Britt, Iowa. The new proprietor will remodel the store and make a number of radical improvements.

# HARDWARE.

WHILE Western organizations of retail merchants are giving much attention to problems connected with department stores and catalogue houses, the New England Hardware Dealers' Association is apparently taking the lead in the matter of trade abuses in the field of Builders' Hardware. Their position in regard to existing evils and what they propose in the way of remedy is explained in part at least in the following resolution, which was adopted some months ago and which has been the subject of correspondence and negotiations with manufacturers and other interested in the subject:

*Resolved*, That the New England Hardware Dealers' Association requests that the manufacturers of Builders' Hardware make no quotation of prices nor give any estimates on contracts to any person except he be a recognized dealer in Builders' Hardware, and that no quotation or estimate be made such dealer on such work at less than said dealer can purchase the same goods for stock.

The interests involved in this matter are so many and diverse that it is questionable whether this resolution will meet the views of all as the best solution of the problem and covering the requirements of the case in an equitable and practicable way. It is, however, serving its purpose as a starting point in the discussion. In this connection our readers will observe the communication in the following pages in which some of the difficulties experienced in the handling of Builders' Hardware are touched upon and remedies suggested.

It may be taken as an indication of a tendency in business that within a few years a powerful combination of Heavy Hardware Jobbing Interests has been developed in the West. Under common ownership and direction there are now houses at Omaha, Sioux City, Denver, Kansas City and Des Moines, and it is understood that an other house representing the same interests may be established at another city and one possibly in Chicago. All the houses are closely affiliated and operated in connection with one another, purchases being made through one purchasing department situated in Omaha. Such an organization probably possesses opportunities for the successful conduct of business beyond those within the reach of separate and competing houses. Apart from the advantages in the buying of goods there should be economies in operation and the benefits of a wise and comprehensive administration.

Among the influences which are changing the character of business the establishment of electrical lines throughout the country is not always given due recognition. It is, however, having a constant effect in many directions. The fact that it supersedes other means of locomotion involves a diminished sale of certain lines, while it carries with it a demand for others and in sufficient volume and diversity to give them an important place in the market. At the same time the prevalence of the trolley system undoubtedly results in bringing residents of the outlying and farming districts into closer touch with the towns and cities, thus stimulating trade and calling into the stores thus favorably affected a larger number of customers. While there are trade centers which are thus benefited, there are others which correspondingly suffer, as business is taken from them and given to their more fortunately situated rivals. It also has important influence in bringing the different classes of trade into closer touch and the purchase and

delivery of goods are facilitated. Other respects in which the trade is affected favorably or unfavorably are touched upon in the article in the following pages.

Such changes in business methods and conditions as are referred to above must be kept constantly in mind by the enterprising and successful merchant. There is in these days, when many apparently well established usages are being disturbed, new conditions developed and new methods required, especial necessity for alertness on the part of merchants and manufacturers. Those who are content to drift along as a matter of course in the old channels are likely as a result of the changing currents of trade to find themselves some fine day high and dry, with a discouraging outlook. If on the other hand there is a quickness in apprehending the tendencies of the times and in adapting one's methods to the new and developing conditions, the merchant will be able to progress in correspondence with the changes which are taking place. Instead of being injured by them he will, by his prompt and enterprising grasp of the situation, make them to contribute to his success. In this way his business will be a growing one so far as is possible under the circumstances in which he is placed, while if a different disposition is manifested and he is content to follow along in the old paths and at an easy going pace, he will be outstripped by his alert and enterprising rivals, who make the most out of the changes which are constantly occurring.

## Condition of Trade.

With the advance of the season there is naturally a letting up in the demand upon the manufacturers, as the larger retailers who purchase from them, as well as the jobbers, have their wants for the present pretty well covered, and are now giving attention to disposing of the goods. There is, however, a considerable volume of business in the way of sorting up orders, and in some lines manufacturers are obliged to give some time to explaining delay in shipments which it is not feasible to make as promptly as the trade desire. They are also troubled somewhat in obtaining raw material. The labor question is engrossing much attention, and is the cause of some solicitude. The machinists' strike is causing embarrassment to some manufacturers of Hardware, but it is not thought that it will be a long continued or serious disturbance. The jobbing trade are very busy, especially in the West, and as a rule prices are being maintained by them with perhaps less cutting than is often indulged in. Many goods, mostly in the line of Heavy Hardware, are scarce and in several lines of staple goods and seasonable articles manufacturers are hardly able to keep up with the demands of the trade. The activity in building gives a larger business in this line than for some time, and the outlook for its continuance is regarded as good. There is little complaint in regard to collections and the financial condition of the trade is considered exceptionally sound. Export business on the whole, so far as Hardware and related lines are concerned, is on the increase.

### Chicago.

(By Telegraph.)

The local Hardware trade presents no new features. The demand for goods is as heavy as at any time this spring, notwithstanding the supposed necessity of farmers now giving their entire attention to planting. The building activity in all parts in the Northwest appears to make up for any deficiencies in trade which might be



due to this condition. City business is remarkably heavy. The retail merchants who pay more or less attention to building material are finding themselves so crowded with business that, like the wholesale merchants, they are also compelled to devote two or three nights a week to catch up with orders. The scarcity previously noted in Wire and Sheet products has not yet been relieved. The Wire manufacturers are swamped with business, and the makers of all kinds of ware from sheet metal find such an urgent demand that they are refraining from soliciting orders. A quiet season must certainly come some time, but so far no indication is seen of any falling off. The Heavy Hardware trade continues extremely active, with merchants also hampered in this line by inability to secure goods with sufficient promptness to keep their trade satisfied.

#### St. Louis.

The volume of business in Hardware continues to increase and a good demand is experienced for seasonable goods especially, and shows a marked increase over this month a year ago. The pleasant weather prevailing for the past few days has brought in a number of orders for hot weather goods. Refrigerators and Ice Cream Freezers are being shipped extensively. There is still a great difficulty in securing Plain and Barb Wire. Buyers are willing to pay a slight advance to secure prompt shipments, but meet with little encouragement, as the mills are unable to meet the demands. Prices are firmly maintained all along the line and no fear exists of a decline, but, on the contrary, advances on some goods are expected.

### NOTES ON PRICES.

**Wire Nails.**—The condition of the Wire Nail market remains practically unchanged. Shipments from mill are made somewhat more promptly, but the demand continues large. The market is firm at former quotations, which are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots.....	\$2.30
To jobbers in less than carload lots.....	2.35
To retailers in carload lots.....	2.40
To retailers in less than carload lots.....	2.50

**New York.**—The local demand for Wire Nails is not quite so steady as it has been. Some days it is brisk, while on others there is a dropping off of requirements. Quotations are as follows:

To retailers, carloads on dock.....	\$2.53
Small lots at store.....	2.60

**Chicago, by Telegraph.**—Manufacturers report a very heavy demand for Wire Nails, with prospects of its continuance up at least until the middle of the year. Jobbers see no indication of a falling off in the demand, the retail trade still sending in very numerous orders for quick shipment. Prices are unchanged, as follows: Carload lots, \$2.45 and small lots, \$2.55, with an occasional concession to \$2.50 to the best traders.

**St. Louis.**—The heavy demand for Wire Nails still continues, and prices are being maintained. Building operations are increasing apparently, and promise to continue to do so. Jobbers quote carload lots to retailers at \$2.55, base, and less than car lots at \$2.60 to \$2.65, base.

**Pittsburgh.**—There is a good demand for Wire Nails, but possibly not quite as heavy as some time since. The mills are catching up on back orders, and are making better deliveries. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots.....	\$2.30
To jobbers in less than carload lots.....	2.35
To retailers in carload lots.....	2.40
To retailers in less than carload lots.....	2.50

**Cut Nails.**—Cut Nails continue in good demand. The irregularity in quotations which has characterized the market for the past two or three weeks is still noticeable. The lack of adherence to the schedule is apparent

in prices made on carload lots and in less than carload lots to jobbers and retailers. The market is represented by the following quotations, f.o.b. Pittsburgh, plus the actual freight to point of destination, terms 60 days, or 2 per cent. off in 10 days:

Carload lots.....	\$2.00
Less than carload lots.....	\$2.05 to 2.10

**New York.**—Locally, the demand for Cut Nails is fair. While there is no quotable change in prices the market is not especially strong. New York quotations for carload and less than carload lots are based on the above prices, to which Pittsburgh freight has been added:

Carload lots on dock.....	\$2.13
Less than carload lots on dock.....	2.18
From store.....	2.25

**Chicago, by Telegraph.**—Jobbers report no change in the demand for Cut Nails, which keeps up to its usual volume. Small lots from stock are held at \$2.35.

**St. Louis.**—There is a good volume of business in Cut Nails, and the tone of the market is strong. Jobbers quote small lots at \$2.35 to \$2.45, base.

**Pittsburgh.**—There is a fair demand, but some slight concessions in prices of Cut Nails are reported in the way of naming low freight rates. We quote carload lots at \$2, and less than carloads \$2.05 to \$2.10, f.o.b. Pittsburgh, terms 60 days, less 2 per cent. off for cash in 10 days.

**Barb Wire.**—The large demand for Barb Wire continues from most sections. In others there is less urgency for large quantities. The mills, however, are running to their full capacity, both on old contracts and new business. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots, Painted.....	\$2.60
To jobbers in carload lots, Galvanized.....	2.90
To jobbers in less than carload lots, Painted.....	2.65
To jobbers in less than carload lots, Galvanized....	2.95
To retailers in carload lots, Painted.....	2.70
To retailers in carload lots, Galvanized.....	3.00
To retailers in less than carload lots, Painted.....	2.80
To retailers in less than carload lots, Galvanized..	3.10

**Chicago, by Telegraph.**—The condition of the Barb Wire business is phenomenal. The demand keeps up to its former volume of business and manufacturers are unable to do any more than distribute their product among the jobbers as well as they can. None are satisfied, but all are insisting on more rapid deliveries. The situation is the more peculiar, as for several years past the use of Barb Wire had shown a continued falling off. Carload lots are held at \$2.75 for Painted and \$3.05 for Galvanized. Less than carloads are quoted at \$2.85 and \$3.15, respectively, with shading of 5 cents to best buyers.

**St. Louis.**—The scarcity in Barb Wire is getting worse instead of better and the demand is unprecedented. Great difficulty is being experienced in securing anything like prompt shipments. Some jobbers are asking a slight advance for small lots for immediate delivery. Jobbers quote carload lots of Painted at \$2.85 and Galvanized at \$3.15; less than carload lots are quoted at \$2.95 for Painted and \$3.25 for Galvanized.

**Pittsburgh.**—Demand has fallen off to some extent, but the mills are fully employed on old contracts, and are running to utmost capacity. There is still some delay by the mills in making deliveries. For domestic trade we quote: Galvanized Barb Wire, \$2.90 in carload lots to jobbers, and Painted, \$2.60. Terms, 60 days net, 2 per cent. discount for cash in 10 days, f.o.b. Pittsburgh.

**Plain Wire.**—An urgent demand for Plain Wire continues. Jobbers and manufacturing consumers have difficulty in obtaining prompt deliveries. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days:

		Base sizes.	
		Plain.	Galv.
To jobbers in carload lots.....	\$2.25	\$2.25	\$2.65
To jobbers in less than carload lots.....	2.30	2.30	2.70
To retailers in carload lots.....	2.35	2.35	2.75
To retailers in less than carload lots.....	2.45	2.45	2.85

The above prices are for the base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances.

## Plain Fence Wire Advances (Catch Weights).

Nos.	Base.	Galvanized.
6 to 9.....	Base.....	\$0.40 extra
10.....	\$0.05 advance over base.....	.40 "
11.....	.10 " " " ".....	.40 "
12 and 12½.....	.15 " " " ".....	.40 "
13.....	.25 " " " ".....	.40 "
14.....	.35 " " " ".....	.40 "
15.....	.45 " " " ".....	.75 "
16.....	.55 " " " ".....	.75 "
17.....	.70 " " " ".....	1.00 "
18.....	.85 " " " ".....	1.00 "

For even weight bundles, 50 pounds and over, 5 cents per bundle advance on above.

**Chicago, by Telegraph.**—The mills are as far in arrears in making deliveries of Plain Wire as at any time this spring. The demand shows no abatement and manufacturing consumers are clamoring for larger shipments to supply their necessities. The jobbing trade is likewise kept in a chronic condition of inadequate stocks. Carload lots are still held at \$2.40, base, and small lots from stock at \$2.50, with an occasional shade to \$2.45.

**Pittsburgh.**—A good deal of difficulty in getting deliveries of Plain Wire is reported by buyers, the mills apparently being oversold. For domestic trade we quote:

	Plain.
To jobbers in carload lots.....	\$2.25
To jobbers in less than carload lots.....	2.30
To retailers in carload lots.....	2.35
To retailers in less than carload lots.....	2.45

Galvanized Wire up to No. 14 is 40 cents advance on Plain; Nos. 15 and 16, 75 cents advance, and Nos. 17 and 18, \$1 advance. Terms are 60 days net, with 2 per cent. off for cash in 10 days, f.o.b. Pittsburgh.

**Hot Air Registers.**—The market for Hot Air Registers is in an unsatisfactory condition, with a good deal of unevenness in prices. The competition of comparatively new manufacturers is troublesome to those who have been longer in the field. It will be remembered that some time ago action was taken by the manufacturers giving lower prices on the common goods which are most in competition, and this is still continued. There is, however, a disposition on the part of those who are making a complete line to extend the relatively low prices thus made on what may be termed competition goods to other sizes and styles. On Black Japanned Registers of leading sizes some very low quotations have recently been made, principally in the West.

**Building and Roofing Papers.**—The market for Building and Roofing Papers shows but slight change from previous reports. Manufacturers are somewhat busier than formerly and there is something of a tendency to stiffer prices, there being evidence of a moderate reaction from the lower prices heretofore made.

**School Slates.**—The School Slate market has been weak for some time, with a declining tendency. Prices are now firmer, and indications point to more stability in this line. The market is represented in a general way by the following quotations:

	Discount.
D Slates.....	50 %
Unexcelled Noiseless Slates,	
60 and 10 and 10 and 10 and 10 %	
Wire Bound.....	40 and 5 %
Double Slates, add \$1 case, net.	

**Paints and Colors.**—**Leads.**—The demand for White Lead in Oil has shown improvement during the past week. There are reports of prices being slightly cut outside of the territory tributary to this point. Manufacturers' quotations are as follows: In lots of 500 pounds and over, 6½ cents; in lots of less than 500 pounds, 7 cents per pound.

**Oils.**—The American Linseed Company have been absorbed by the Union Lead & Oil Company. For some time the former company have been offering Western Oil at a less price than independent mills have been willing to meet. The consolidation introduces a new uncertainty into the market, as the policy of the new company regarding prices is unknown. There are rumors to the effect that they will endeavor to control other Oil and Lead companies. Demand for Oil has been more active during the week, owing principally to the advance of the season. No change in prices has been announced. City Raw is quoted at 61 to 62 cents, ac-

cording to quantity. Out of town Raw is quoted at 59 to 60 cents by different concerns for lots of 5 barrels and over.

**Spirits Turpentine.**—Buying for export in the Southern market has caused an advance in local prices. Demand has been quiet at the higher values. Quotations at this point are as follows, according to quantity: Southern, 35½ to 36 cents; machine made barrels, 36 to 36½ cents per gallon.

**Glass.**—All the factories controlled by the American Window Glass Company and the Independent Glass companies went out of blast on May 15. About half of the factories outside of the control of the two companies also went out on the same date. It is expected that the remainder of the factories will be closed by June 1. Locally, trade is referred to as quiet. Jobbers' quotations are as follows:

	Discount.
Less than car lots.....	.80 and 20 %
Carloads.....	.85 and 5 %
3000 boxes.....	.87 %

These prices are for single or double strength, and cover the entire country.

## THE COST OF DOING BUSINESS.

THE following communication from a successful New England house is deserving of the careful attention of every retail Hardware merchant, emphasizing as it does the importance of knowing the cost of doing business as a condition of success:

It is surprising that many good business men deceive themselves in regard to the cost of doing business—that is, the total cost as compared with the total sales. If they are making a good profit such a mistake may do little harm, but if the profit is small the error may be disastrous. We occasionally hear of a retail business being done at about a cost of 10 per cent., but if the matter was investigated it would probably be found that several items of expense had been omitted and that the actual cost was nearer 25 per cent.

Interest on the capital should be charged at a fair rate, say 5 per cent. The salary of each partner should be figured as part of the expense. All clerk hire, commissions, rent, taxes, insurance, heating, lighting, advertising, traveling, postage and office expense, breakage and repairs, freight and cartage, as well as all material used in the store, such as paper, twine, &c., should be included; in fact, the expense of doing business covers every cent paid out except the invoice cost of the goods, and no concern can live unless they add to the invoice cost enough profit to cover all expense of every description. If the invoice cost of an article is \$1 and it is sold for \$1.25, it is easy to say we are making 25 per cent., but if the cost of doing business is 25 per cent. of the sales, we are selling at a loss of about 6 per cent., instead of a profit of 25 per cent. It should be remembered that 33 1-3 per cent. should be added to the cost to cover the expense of 25 per cent. on the sales. It often happens that a line of goods must be sold at an advance of 5 per cent. or 10 per cent. over invoice cost, but if \$100 are sold at 5 or 10 per cent. advance, another \$100 must be sold at 40 to 45 per cent. over invoice cost to keep the sales on a paying basis. Jobbers sometimes make a failure by selling goods on a margin of 2½ to 10 per cent., when their expenses average 10 per cent. on the total sales.

After inventory is taken it is a good plan to look the thing squarely in the face and ascertain the total cost of doing the year's business. If the result is unsatisfactory it may lead to greater care in the future.

A business which only pays expenses cannot be called profitable; especially as bad debts are not figured in the regular expenses, and no allowance is made for goods which prove to be unsalable.

Charles Waite has admitted Fred Innes to partnership in his Hardware business in Hutchinson, Kan., and the style of the firm is Waite & Innes. A general overhauling of the store has been made. The firm will give special attention to Stoves and House Furnishings.



## Hardware Organizations.

### CHICAGO RETAIL HARDWARE MEETING.

On the evening of the 17th inst. a meeting of retail hardware dealers was held in one of the assembly rooms in the Masonic Temple, Chicago, under the auspices of the Chicago Retail Hardware Dealers' Association. A good representation of the city trade was in attendance, dealers having turned out from all sections in response to invitations issued by Secretary G. R. Lott, who fills that position for both the city and State organizations. The meeting was called to order by President D. McLaughlin, who explained that the purpose of the gathering was to inform the dealers what the State and national organizations are doing for them. Feeling that every dealer should be kept in touch with these organizations, it had been thought advisable to invite Z. T. Miller of Bloomington, past president of both associations, to deliver an address on the nature and necessity of the work now being conducted and what had been accomplished. Mr. Miller was received with great applause and delivered a most interesting address.

Mr. McLaughlin followed with a strong appeal to all dealers not now connected with any association to join one and thus assist in strengthening the movement of organizing the retail trade.

G. R. Lott made an interesting statement of the work being done by him in securing new members for the State association. He has recently been making trips to cities in the northern part of the State to call upon dealers who are not members and have not attended association meetings. In all cases brief arguments were effective in securing applications for membership. He had been so encouraged by his success thus far that he proposed to keep it up. Mr. Lott gave a number of details relative to the work being done by the State association, showing that important results are being secured which will benefit the retail trade.

Brief remarks were made by Treasurer J. L. Smith and others. President McLaughlin announced that the annual picnic of the Chicago Association would be held July 17. The meeting then adjourned.

### SOUTHERN HARDWARE JOBBERS' ASSOCIATION.

The programme for the eleventh annual convention of the Southern Hardware Jobbers' Association has just been issued. As the trade are aware, this convention will be held at Asheville, N. C., on June 4, 5, 6 and 7, the scene of the deliberations being the Battery Park Hotel. It is evident from an inspection of the programme that the meeting will be an interesting and instructive one, provision being made for a number of addresses on timely topics by well-known manufacturers and jobbers.

The convention will be called to order on Tuesday morning, the first session being an open one. Col. B. F. Eshelman of Stauffer, Eshelman & Co., New Orleans, on behalf of the jobbing interests will make a special address of welcome to the manufacturers present. The response for the manufacturers will be made by W. R. Walkley of the Peck, Stow & Wilcox Company of New York City. These addresses will be followed by the annual address of the president of the association, J. D. Moore of the Moore & Handley Hardware Company, Birmingham, Ala. The first morning session will close with an informal reception of manufacturers, jobbers and other visitors. The Tuesday afternoon session will be of an executive character.

Another joint session of manufacturers and jobbers and their representatives will be held on Wednesday morning. This session will be characterized by numerous formal addresses by manufacturers and jobbers. The topics selected are as follows:

"Price Guarantees," by Robert Garland, Standard Chain Company, Pittsburgh.

"The South, Socially and Commercially," by Geo. W. Lee, Eberhard Mfg. Company, Cleveland.

"Classified Lists vs. Quantity Discounts," by Thos. W. Fritts, Tom Fritts Hardware Company, Chattanooga.

"The Future of the Trusts," by James P. Kelly, Kelly Axe Mfg. Company, Alexandria, Ind.

"Unity of Action on Prices and Terms," by W. T. Shannon, American Sheet Steel Company, New York City.

"Differentials Between Jobbers and Retailers," by T. W. Gathright, May & Thomas Hardware Company, Birmingham, Ala.

"Combinations," by C. M. Fouche, Crucible Steel Company of America, Pittsburgh.

"Southern Trade and Expansion," by Geo. H. Harper, Clendenin Bros., Baltimore.

"The Traveling Man—A Welcome Visitor?" by A. P. Duncan, McLendon, Duncan & Co., Waco, Texas, and W. H. Kettig, Milner & Kettig Company, Birmingham, Ala.

The other sessions of the convention will be of an executive nature, during which papers discussing the following subjects will be presented by members of the association:

"Policy, Potency and Proficiency of the Southern Hardware Jobbers' Association," by W. M. Crumley, Beck & Gregg Hardware Company, Atlanta.

"Who Shall Do It and How Should Traveling Men be Posted as to Prices?" by J. H. Fall, Jr., J. H. Fall & Co., Nashville.

"Best Methods of Employing Traveling Men," by Spencer James, Piedmont Hardware Company, Danville, Va., and Robert F. Bell, R. E. Bell Hardware Company, Weatherford, Texas.

"How Can We Make Staples Bear Their Proportion of the Expense of Doing Business?" by James J. Mandelbaum, Fones Bros. Hardware Company, Little Rock, Ark.

The entertainment of those who attend the convention has been carefully considered, and a number of social features are announced which should prove interesting and enjoyable. The Reception Committee, as usual, consists of more than 50 prominent manufacturers and traveling representatives, who will doubtless succeed in making visitors to the convention thoroughly at home.

Announcement is made that a one and a third fare for the round trip has been granted by a number of the passenger associations on the certificate plan.

### HARDWARE CLUB OF NEW YORK.

The following persons were elected to membership in the Hardware Club at a meeting of the Board of Governors held May 20:

George E. Barton, 3 Park place, New York.

D. J. Carroll, 303 Pearl street, New York.

Thomas B. Clatworthy, 93 Chambers street, New York.

Safford K. Colby, Pittsburgh Reduction Company, New York.

Henry Gleason, 258 Broadway, New York.

T. H. Gossett, Peck, Stow & Wilcox Company, New York.

Howard S. Hart, Hart & Cooley Mfg. Company, New Britain, Conn.

Barton E. Kingman, 60 Worth street, New York.

D. H. McConnell, 126 Chambers street, New York.

E. Bertram Pike, Pike Mfg. Company, Pike Station, N. H.

James H. Ritter, Biddle Hardware Company, Philadelphia.

George S. Terry, 277 Broadway, New York.

John Adams Thayer, 17 West Thirteenth street, New York.

Morris S. Thompson, 256 Broadway, New York.

Walter L. Tyler, 220 Broadway, New York.

T. S. Van Volkenburgh, 62 Worth street, New York.

Alfred Weed, Nicholson File Company, Providence, R. I.

Frank F. Weston, 99 Chambers street, New York.

William T. Woodruff, Thomaston, Conn.

### ILLINOIS RETAIL HARDWARE DEALERS' ASSOCIATION.

President H. G. Cormick of the Illinois Retail Hardware Dealers' Association, Centralia, Ill., has begun to make trips through the State to solicit new members for the association. He visited a number of cities during the past week, and was very successful in this work. In

some cities all the dealers who were visited joined the association. He states that he finds the trade alive to the conditions which surround them, and a very short talk is required to secure applications for members.

### NATIONAL RETAIL HARDWARE DEALERS' ASSOCIATION.

The announcement recently made in these columns, that the National Retail Hardware Dealers' Association had incorporated under the laws of the State of Illinois, was premature. At the time the announcement was made all arrangements had been perfected for such an incorporation, but subsequently it was found that the laws of Illinois require the main office of Illinois corporations to be located in the State. As the president and secretary reside in Indiana, this was not practicable. It was therefore decided to incorporate the association under the laws of the State of Indiana.

## THE DIFFICULTIES IN SALE OF BUILDERS' HARDWARE.

### A Merchant's Letter on the Situation.

*To the Editor:* I have read your editorial in your issue of May 9, and it seems to cover the ground pretty thoroughly. As you state, there is no branch of the business that is so troublesome to the Hardware trade, and perhaps the manufacturers, as Builders' Hardware.

#### Difficulties

1. One of the evils, from the manufacturers' point of view, seemingly is that a great many in the trade call for them to furnish men to show the line, taking off the schedule from the plan, doing all the necessary detail work to secure the contract, and even taking the contract themselves. Now perhaps this cannot be stopped, as the manufacturers put a large amount of money into special patterns, and cannot afford to jeopardize their interest by leaving it to incomplete samples and possible misrepresentation. These manufacturers state that this work is actually being forced upon them by the trade.

Granting this, there are a good many in the trade that have competent men to handle this class of business and who have samples and other necessary means of securing this class of business, but they are not protected by having any better price than the dealer who asks the manufacturer to do all this work for him. Now our idea is that if the manufacturer does this work he should be paid for it, or at least partially so, and if the dealer does it he should have his pay.

2. We also think the manufacturers are altogether too jealous of each other regarding patterns. They get out too many new styles, as no sooner does one manufacturer get out a pattern, which he may have a large order for, than the rest all follow suit, whether they may have a demand for it or not. This results in their trying to get returns by forcing these upon the market, resulting in competition which is not profitable. The multiplicity of patterns, added to the variety of finishes, so disturbs the factory that it cannot possibly keep in stock any of the essentials, so that serious delay is brought about, to the dissatisfaction or loss many times of most of the profit and good feeling.

3. Another evil which should be corrected, in our opinion, is the manufacturers taking contracts, covering everything to be used in the completion of the building, at a lump price. This is more often unprofitable than profitable, and is the cause for dispute and ill feeling.

#### Remedies.

In our opinion, some of these evils might be corrected by these suggestions:

1. That the manufacturers allow the dealer a discount of 10 per cent. beyond the regular price where he secures the business, the manufacturers keeping this extra 10 per cent. where they furnish men to secure it.

2. Let each manufacturer get out only such styles as he has a legitimate use and demand for, and attend more strictly to getting his business into such shape that he can fill orders with reasonable promptness.

3. Estimates should be made by schedule, covering quantities and description, unless architects furnish plans and specification, properly signed by both parties, so that all extras can be accurately adjusted.

4. Other things can profitably engage the attention of the association of manufacturers, one of which is a uniform system of classifying finishes. The manufacturers apparently think that they must make their system so complex that only they can understand it. This is foolish and unnecessary and acts as a positive hindrance to any one contemplating using a different line of goods than what they have been accustomed to. An example is a dull brass finish, Yale, A. Y. 22; R. & E., No. 9; Corbin, No. 20; Sargent, O. B.; Reading, No. 37, and Lockwood, No. 13. It is often necessary to match Hardware of other makers with outside things, and the present system is confusing and annoying. Anything tending to diminish detail will prove of benefit to both manufacturer and dealer.

## ELECTRIC LINES FROM THE TRADE STAND-POINT.

BY OBSERVER.

As one rides through the highways and byways of the country to-day, snugly seated in an electric car, the question comes into mind: What changes are these lines about to make in the old ways of doing business?

The electric lines are spreading out from every business center like a cobweb, and it is predicted, and with good reason, that they will form a net work over the country, bringing the smallest places into close touch with the larger cities.

#### Attractions of Electric Roads.

The moment a line is operated it is adopted by the public as a new means of pleasure, outdoing for the time all other forms of recreation. But it soon becomes the necessary mode of travel both for business and pleasure.

When such a line is in competition with a steam road it draws trade, because wherever a person wants to get on or off there is an imaginary station, and the cars stop for his convenience. They accommodate the person who is a few seconds behind time, not pulling out or going on because one is a few feet away from the crossing at the exact moment the car is scheduled to pass that point.

What these lines will accomplish by way of giving country people easy and cheap access to the city, and city people the opportunity to find cheaper homes in the country and yet work in the city, it is impossible to guess. That great changes will grow out of this quick means of communication is a foregone conclusion, and in some sections the evolution is now going on.

#### Effect on the Retailer.

But what will be the change to the business man?

The first change that is noticed by traveling men is that retailers living in towns on electric lines are buying in smaller quantities than heretofore, and carrying lighter stocks of all such goods as they buy from the jobber. If the jobber is not more than an hour's ride away, the retailer can promise a customer any article that he may be out of within a very short time. He can ride to the city and return laden in a small part of the day.

#### The Retailer's Customers.

What will these lines do for the retailer's customer?

They are fully as convenient for him, if he wishes to reach the larger dealers in the city, as they are for the dealer. That he will avail himself of this goes without saying, but to what extent time alone can tell.

#### A Blessing in Disguise.

We are told of the experience of a dealer in a town of 4500 people, situated 30 miles from a city of 100,000 inhabitants. An electric road ran from the larger to the smaller place, but all the retailers of the smaller



town united to prevent its entrance, and it was compelled to stop at the edge of the town.

After the road was running a year the opposition to its use of the streets was withdrawn, and the almost universal opinion was that it brought as many people to that place from the country as it took to the city where was its headquarters. And when the road extended its line 10 or 15 miles further, into a territory tributary to the smaller town, it was then recognized as a great blessing by the men who had once opposed it so firmly.

#### The Traveling Salesman.

These roads are also revolutionizing the traveling salesman's work. He no longer has to spend half a day or more in a village where his business can be done in an hour or two. When he is ready to depart the electric car is not far away, and he can make as many towns in one day now as he formerly made in two or three days.

#### Breaking Away from the Old Order of Things.

The electric lines are putting the country dealer into close touch with city methods, and enable him to carry a smaller stock with greater variety, and will necessarily permit him to care better for his trade. They compel him to take a step forward and upward.

Those who will profit most by the evolution in our new ways of doing business are the men who will promptly accept the new order of things, and remodel their methods so that they shall be at the front.

It is only in fables that the tortoise beats the hare.

#### REQUEST FOR CATALOGUES, &c.

*The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues quotations, &c., relating to general lines of goods.*

W. A. Gray & Son, Sidell, Ill., have disposed of their Shelf Hardware, Stove, Tinware, Sporting Goods and furniture stock to Bushnell Bros. The new proprietors advise us that they would be pleased to receive catalogues and price-lists relating to the above lines.

N. J. Smith will open a new Hardware and Stove store at Minerva, Ohio, about June 1, and will be pleased to receive catalogues, price-lists, &c.

#### AMERICAN CAN COMPANY.

THE INDEPENDENT CAN COMPANY, incorporated April 20, 1901, under the laws of the State of New Jersey, with a capital of \$1,000,000, have been absorbed by the American Can Company, otherwise known as the Can Trust. The company were formed for manufacturing solderless Tin Cans by a process patented by C. F. Mendham in England and other foreign countries, and more recently in the United States. George P. Benjamin, 81 Fulton street, New York, the treasurer of the company, says: "There is little to say beyond the mere statement that we have sold our United States patents to the American Can Company. They consisted of a number of patents on Can making machinery and solderless Tin Cans, all issued within the last few months, the last one only ten days ago, and, I believe, were the only patents of any importance not controlled by the American Can Company. An arrangement has been made which is satisfactory to all concerned."

The Independent Tin Can Company are believed to have been backed to a large extent by English capital, a plant having already been established in London which is now turning out about 5,000,000 Cans a week.

#### TRADE ITEMS.

THE FOX MACHINE COMPANY, Grand Rapids, Mich., are making an exhibit of their specialties in Block 38, Machinery Building, Pan-American Exposition, Buffalo. The company claim to be the original manufacturers of Steel Sash Pulleys, which form a conspicuous part of this exhibit. In addition to the Sash Pulleys the company also exhibit Iron and Wood Working Machinery, and the Fox Typewriter, which, we are advised, is rapidly increasing in favor.

BEALS & Co., Buffalo, N. Y., dealers in Iron, Steel and Heavy Hardware, have issued a folder in which a map of the city and plan of the Pan-American Exposition are presented. In an accompanying circular they invite the trade to make their store headquarters for the receipt of mail, telegrams, &c., while in the city. They have opened a check room for the use of their customers, so that packages and bundles may be left in their care.

FAYETTE R. PLUMB of Philadelphia has just been chosen president of the Manufacturers' Club of that city.

ALLERTON-CLARKE COMPANY, 97 Chambers street, New York, have been appointed selling agents for the Parr Saw Sets, Morrill pattern, made by the Parr Tool Company, Buffalo, N. Y. Both No. 1 for all Hand Saws and No. 3 for all kinds of Cross Cut and Circular Saws, 14 to 20 gauge, are made. The dies are made of tool steel and the handles of malleable iron.

THE trade will observe among the Special Notices one signed "Salesman," in which the advertisers announce that they desire to make arrangements with a canvasser who will sell their line of goods on commission to the jobbing and retail Hardware trade. The opportunity may be deserving the attention of those who are in a position to render the services referred to.

#### J. D. WARREN MFG. COMPANY.

THE general interest in the improvement of Hardware stores by the adoption of more modern fixtures is demonstrated by the large number of firms who have during the past few months ordered outfits of Hardware Cabinets, Sectional Shelving, &c., from the J. D. Warren Mfg. Company, Chicago, Ill. From a partial list furnished by the company of houses from whom they have received orders we observe that the demand for improved fixtures is very general, coming from all parts of the country, North, South, East and West. The company also report a good business from abroad, two recent orders being from John Kelly & Son, Edinburgh, Scotland, and C. W. Burton, Griffiths & Co., Ludgate Hill, London, England.

#### WILLIAM G. ROGERS COMPANY.

WILLIAM G. ROGERS COMPANY, recently organized under Massachusetts laws, are manufacturing Silver Plated Ware, having leased a portion of the factory of Nichols Bros., manufacturers of Butcher Knives and Tools, at Greenfield, Mass., and are prepared to make staple and fancy goods, including A1 double and triple plate. The officers of the company are: William G. Rogers, president, New York; W. E. Nichols, treasurer, and J. H. Nichols, secretary, Greenfield, Mass.

#### PRICE-LISTS, CIRCULARS, &c.

MAINE MFG. COMPANY, Nashua, N. H.: Leaflet describing the White Mountain Refrigerator, its construction, special features, &c.

SHIMER WOVEN WIRE FENCE COMPANY, Anderson, Ind.: "The Shimer Outlook," issued in the interest of the Shimer Crimped Spring Fencing.

THE SCRANTON AXLE WORKS, Scranton, Pa.: Vehicle Axles. The company have issued a neatly printed catalogue illustrating their line of Axles. Particular attention is called to their Osgood Patent Box, which can be applied to any Axle, the Common Sense Ball Bearing Axles and Drop Forged High Arch Axles, the latter made in 400 League Dug Out Collar and with Osgood Box.

THE AMERICAN NEWS COMPANY, New York: Illustrated price-list of Sporting and Outing Goods for 1901, covering Baseball Supplies, Tennis Goods, Hammocks, Kites, &c.

C. S. COOLIDGE, Troy, Ohio: Catalogue 1901 showing his line of Troy Parcel Carriers for bicycles, carriages, &c. It also illustrates the Troy Canvas Gun Case, Night Watchmen's Detectors and Police Detector.

SCULLY STEEL & IRON COMPANY, Chicago, Ill.: Stock list for May and June, 1901.

# Notes on Foreign Trade

## BRITISH LETTER.

Office of *The Iron Age*, HASTINGS HOUSE, NORFOLK ST., LONDON, W. C.

### State of the British Hardware Trade.

**T**AKING a look round the whole of the British Hardware trade, it can hardly be said it is in a good way. In some departments there is practically nothing doing, but there are signs of vitality in others. Carriage iron work is at present in strong demand, while the usual orders are coming in for various lines of Hardware from the seaside resorts, where preparations are being made for the Whitsun holidays. There is a brisk demand for Guns, both for Australia and Germany, and orders are now coming in from Canada, Newfoundland and British Columbia. They are rather later than usual this year, and present appearances point to their being rather less in volume, but upon that point it is impossible to speak with certainty. There is an increasing and progressive trade in Hardware and Metal Goods being done with Mexico, not only in the usual Hardware lines, but also in railway and mining material. Large orders have been received both in the Midlands and in Sheffield from the army authorities for Canteen Hardware of various shapes and descriptions. Some of the orders received from the army are very large and are filled with difficulty, and I am not sure if any contractor who has supplied the American Army might not meet with some success by tendering to the British Army authorities, or at least by tendering to successful contractors to the army.

Now that fine weather has come, the building trades show distinct signs of revival, and Builders' Hardware is selling more readily, particularly Nuts and Bolts. Doubtless the improvement in the building trades has favorably affected the brass foundry business, for a good trade is at the present time being done in Taps, Unions, Hydrants and Lavatory Fittings; but while trade is improving in the directions indicated, it does not appear to be particularly remunerative. In Sheffield, the deductions in the cost of various materials have slightly eased the market, but not to the extent anticipated. The File trade is not doing so well, and there is a very marked reduction in the demand for large files. Small Files are still selling readily, and, strange though it may seem to American readers, the Sheffield hand cutters are at the present time busily engaged. Government orders are also in evidence in Sheffield, particularly for Shovels, Picks, large Hammers and railway Trenching and Excavating Tools. These army contracts have done much to keep Sheffield manufacturers busy, when otherwise trade would have been unusually slack. The Cutlery trade, particularly in the export department, is lethargic. The best lines in Pocket Knives are selling freely enough, but in the medium Cutlery, such as is usually sent to Russia, Sweden and Belgium, trade is flagging. In Cutlery, Australia and Canada are still excellent customers. The note of the last month has been a great strengthening of the Australian trade. Wherever metal goods are handled, orders are coming freely from Australia. These Australian orders have a good deal to do with the strengthening in this country of the Galvanized Goods trade, which has been going badly for some time past, but which, it is now hoped, will continue healthy for some time to come. The Hardware retail trade in Great Britain is doing only moderately well, and money is tight, notwithstanding the fact that Consols are lower in value than they have been for ten years. Still, an enormous sum of money is locked up in tenders for various war loans, and that has a distinct influence upon the average money market.

### Australia and America.

The mention in the foregoing paragraph of the great improvement in Australian trade reminds me that British exporters are showing signs of genuine concern for the future of this trade. American Hardware is being felt in this market, and notice is taken of a recent shipment from New York to New Zealand, which, among

other things, included 400 tons of Sewing Machines, a gas plant weighing 500 tons, Rifles, Shot Guns, Re-

volvers and Ammunition galore, with Lawn Mowers, Reapers, Wagons, Wheels, Coffee Mills, which were reckoned by tons. To pile Pelion upon Ossa, there were also 1000 tons of metal, 1200 tons of Bar Iron, not to mention hundreds of pianos and organs.

### Extent of Australian Trade.

A valuable commentary upon the truth of the foregoing is that of the trade returns, which show the increase in the combined trade of the Australasian colonies. I subjoin herewith a few of the characteristic years, showing the progressive increase:

	Total value.	Per head of population.
1825.....	\$2,559,990	\$53.50
1841.....	27,865,000	111.00
1851.....	44,788,050	92.64
1861.....	261,141,035	209.98
1871.....	347,370,420	179.58
1881.....	506,554,835	183.14
1891.....	723,831,425	188.39
1892.....	613,808,315	155.70
1893.....	585,861,290	145.50
1894.....	548,459,505	133.41
1895.....	564,053,965	134.41
1896.....	645,698,105	150.92
1897.....	690,505,530	158.14
1898.....	736,436,340	165.60
1899.....	806,573,175	181.12

### An Opening for Iron Wire.

The attention of American exporters should be directed to Algeria. Next September the sale of corkwood collected from the State forests will take place. The quantity to be sold will amount to 60,000 quintals (6000 tons), while the output from the forests in the hands of individual proprietors will reach double that amount, say 12,000 tons. To bale this quantity Iron Wire is used at the rate of about 1 kg. per quintal, or a total supply of about 180,000 kg., equivalent to about 400,000 pounds, of which the greater part comes from France and only a little from Germany. A correspondent in Algeria, writing to a prominent British trade paper, suggests that British firms might well compete. There is no reason why they should not, nor is there any reason why American firms should not also. The particular Iron Wire required is described as *fil de fer recuit* Nos. 14 and 16, to be delivered either at Oran, Algiers, Philippeville or Bona. I may also add that one firm employs iron ribbon about 6-8 inch wide for baling the better qualities.

### Trade in India.

Gloomy reports are to hand as to the state of trade in India. There can be no doubt that the famine is still raging, while the Viceroy of India prophesies another famine. I have already, on previous occasions, pointed out some difficulties and pitfalls connected with the transaction of trade with native merchants. A possible customer should be found in the Indian municipal service. For example, I read in the agenda of the Municipal Corporation for the city of Bombay, held on April 11, that a recommendation is made sanctioning the payment to an engineer of \$75 for advising the municipality on the question of Water Taps. There are several references on this agenda to the fact that the municipal officers have exceeded their grants in the engineering departments. For example, the committee recommends the sanction of a grant of 1300 rupees to meet an excess in the grant for the Public Health Department, surface draining, cleaning, labor, &c. Then there is a recommendation to sanction the construction of a cart road at a cost of 36,757 rupees. Another grant of 7144 rupees is asked to meet an excess in the grant for the Executive Engineer's Department, maintenance of pumping station, repairs to machinery, contingencies and stores, water supply and water meters. An agenda sheet like this indicates activity which might well be exploited by American exporters. I question if it will be very long before the large Indian municipal corporations are laying down electric plant for purposes of light and traction. So that while business is adversely affected by the fam-



ine, and the smaller buyers are hard hit, it is clear that there is a market in India for metal goods of one sort and another. In this connection I venture to quote, by way of warning, from an American traveler who has recently concluded a long journey through the Far East:

The practice of shipping goods inferior to samples prevails in American export trade to an alarming extent. Why it should be so I do not know, but it is. I do not want to be understood as saying that there are not honorable, conscientious business men in America as well as other countries. But the American has done this thing, and the American business house is looked upon with a certain degree of suspicion, which is well founded.

I do not indorse absolutely what is said by this gentleman, but I have heard complaints from Indian merchants somewhat in this strain. The traveler in question concludes his remarks with these words, which find indorsement from an Indian trader whom I have consulted:

I believe America can have the call on all the vast Oriental trade if she will try to merit it. Give the merchants there fair, honest dealing, ship the quality of goods they buy and the full quantity, pack them as they want them packed, and don't bill them to be shipped at owner's risk and without recourse when through faulty packing they are almost sure to arrive in a damaged condition.

### THE DIVERSITY OF EXPORT BUSINESS.

To give an idea of the heterogeneous character of American manufactured products exported by New York merchants we enumerate below a few items culled at random in a cursory examination from the order book of C. B. Corwin, 15-25 Whitehall street, New York, who represents as export sales agent about 70 American manufacturers. Mr. Corwin, earlier in his business life was for years identified with the heavy Hardware trade in this country before domestic manufactures had reached the present volume of consumption abroad. One shipment relates to two Merry-Go-Rounds or Riding Galleries, one of which went to Egypt and one to the Madeira Islands, which with the accompanying accessories netted about \$3000 each. Negotiations are pending for several more to various countries. Other items are 240 Desks for Europe, and 500 Sulky Plows for South America.

A transaction of an entirely different character was an order for a Band Saw Mill and other Wood Working Machinery, made by the J. A. Fay & Egan Company, Cincinnati, Ohio, which with the necessary engine and boiler aggregated \$4200 in value. In the way of Mouse Traps he recently sent to Europe 1000 gross of a patented style made by a Pennsylvania concern. Another shipment consisted of an outfit for a creamery for a prominent South American country, which without power amounted to \$5000, and is said to be the first outfit of this character sent to that particular country. To the same part of the world have also been recently shipped four carloads of Wind Mills. On account of George M. Clark & Co., Chicago, Ill., a carload of Gas Stoves have been shipped, and since March, 1, 1901, over 70 orders have been received for the Hammocks produced by I. E. Palmer, Middletown, Conn., for shipment to widely distributed points.

Sales of American Machine Tools are increasing in volume in the South American countries, important orders having been taken lately for Cincinnati makers represented by this house, among whom are Lodge & Shipley Machine Tool Company, Bickford Drill & Tool Company, Cincinnati Planer Company and Cincinnati Shaper Company. On account of Gaar, Scott & Co., Richmond, Ind., he has recently shipped to Mexico and South American wheat raising countries \$15,000 to \$20,000 worth of Threshing Machines and Portable Engines with which to operate them, and three complete flour mill plants made by another Indiana concern.

In addition to the manufacturers represented by Mr. Corwin for export he has just been appointed the export sales agent for Stromberg-Carlson Telephone Company, Chicago, and the National Sweeper Company, Marion, Ind., the latter manufacturing Clothes Wringers and Carpet Sweepers.

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## SHOW WINDOW DISPLAY.

*This Department is to give information in regard to the use which may advantageously be made of show windows of Hardware stores, with practical suggestions in regard to the arrangement and display of goods and other methods of attracting business.*

*The trade are invited to contribute information in regard to methods which have proved satisfactory, with descriptions of attractive displays. Inquiries also are solicited, to which careful attention will be given.*

### WINDOW DISPLAY IN THE HARDWARE STORE.

(First Prize Essay.)

BY H. C. WISEMAN.

AM reminded every day in the week, in passing unused or badly used show windows, that some one is losing the value of what should be his best investment. A show window is for use, not for neglect or abuse. It should be a thing of beauty, not a blot. It is an investment as surely as any other feature of the business, and intended for large results. The windows are the eyes of the store. Through them people see, are seen, and are attracted. More money is frequently put into their building and arrangement than into any other part of the business, and they as often bear more than their share of neglect. They should in part pay insurance, pay rent and pay help. They are the silent salesmen that, without expense, may be made to dispose of hundreds of dollars' worth of profitable goods each season.

#### Neglected Windows.

The causes of neglect are very many. Some of them are real, many more are imaginary. Lack of time, lack of taste, lack of material, poor windows, and poorer

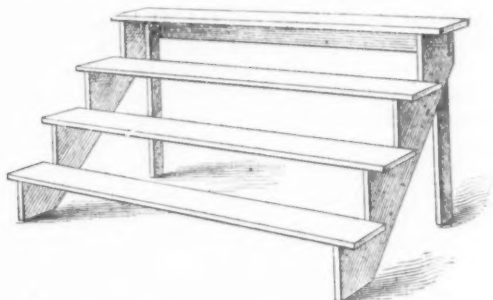


Fig. 1.—Stand for Displaying Goods.

locations, are offered as a few among a great number, and none of them have any value whatever as reasons for neglect. We don't forget or neglect the keeping of our books, the buying of our goods, the arrangement of our shelves, the taking of stock, the changing of

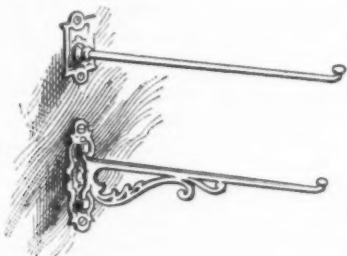


Fig. 2.—Brackets from 12 to 20 Inches Long, Both Stationary and Hinged, so as to Throw to One Side When Not in Use, Are Time Savers to the Window Dresser.

prices. Why this? We make time for all these things and many more.

If one man lacks taste, another one has it, or his own work will improve wonderfully with the trying. There

is never lack of material, for, if the stock be naught but Nails, Bolts and Screws, they have great possibilities in the hands of an ingenious man. Again, the poorer the window the greater the effort should be to make it attractive, and no matter how poor, it can be made so, as witness a statement made later in this article.

A poor location calls more loudly than all else for that which will attract in display windows, and many of our most successful Hardware merchants of to-day are, or

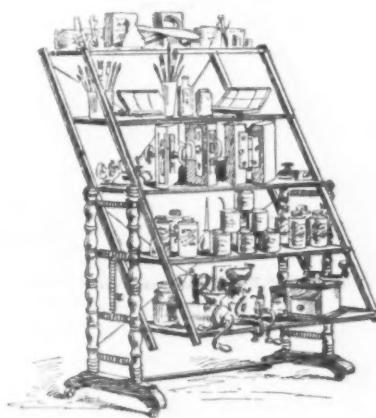


Fig. 3.—Adjustable Display Stands on Which Goods May Be Attractively Arranged Both in Window and in Salesroom.

have been, in the poorest locations, owing much or all of their success to extraordinary efforts as to store arrangement and window decoration.

#### Attractive Show Windows.

Attractive show windows are desirable always, and for a hundred good reasons. They give standing and the appearance of stability to the firm. People learn to watch for and expect to learn from them; customers are

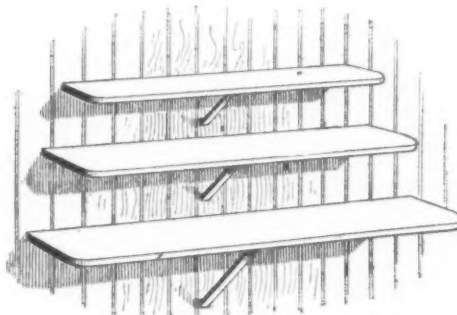


Fig. 4.—Hinged Shelves for Show Windows that May Be Let Down and out of the Way When Not in Use.

interested where the proprietor shows interest, and the proprietor is always somewhere back of good, intelligent window dressing. You frequently hear the question asked, Have you seen such and such new ware in Blank & Co.'s window to-day? Your windows and what you have in them, and the prices, are carried in the hearts of more people than you know of.

Windows sell goods beyond all other methods when properly arranged, and are desirable and attractive not only to the trade, but to the store itself, in that they are



a correct barometer as to the popularity of what you have to offer. They sell more goods of a kind than would otherwise be sold, and that is the greatest point in hand. Over and over again this point is easily and readily verified.

#### Frequent Mistakes.

There are many mistakes made in arrangement and in numerous other ways, leading to bad results or no results at all, and show windows are at times charged



Fig. 5.—Straight and Curved Pieces of Plate Glass, Which Make Very Handy Stationary or Suspended Shelves for Displaying Goods.

with not being worth the time given them. A poor arrangement is bad enough, a crowded arrangement is worse, and is the cause of more failures to attract than almost any other that may be named.

The want of selling or price cards will turn away many customers who would otherwise stop and decide, but who positively will not enter inside to ask it. In these days every article exhibited should show a price in plain figures. Two-thirds the work of selling is done, and this is where the "silent salesman," without salary, pays the bills.

Another grievous mistake is that of not finding time to change displays often. Like an advertisement of too long standing, the eager public tires of it. The same public is every day being educated to watch for changes and for new goods and for new prices. Other mistakes are those of bad light, which can nearly always be remedied; the showing of season goods out of season, simply to fill the windows; lack of variety in goods shown, and

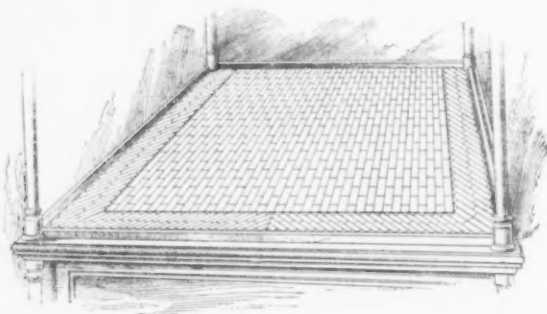


Fig. 6.—Floor of Show Window, Made of a Single Color of Light Tinted Tile.

lack of any fixtures or preparation for making exhibits attractive. These and many others are purely local and should right themselves with ordinary attention.

#### Fixtures.

As to necessary fixtures and their urgent need, much depends on the store and the man. Where there is lack of skill, more lack of inclination for the work, then handy fixtures, such as racks, Fig. 1; brackets, Fig. 2; stands, Fig. 3; shelves, Fig. 4, and straight or curved pieces of plate glass, Fig. 5, become an absolute necessity. They can be changed about, set away, brought forth from time to time, and become, in fact, a

stock in trade for window dressing purposes. With many clever heads little of anything is required, and store boxes, boards and cloths answer every purpose. The writer recalls a number of very handsomely designed windows where no helps outside the goods, other than boxes and white paper, were called in aid. To such men the task of window dressing is not an onerous one.

There are occasional mechanical novelties used by many for purposes of attraction, but unless bearing directly on the lines of goods shown they soon lose their value and are not remembered as are the goods themselves and their prices when well displayed. The vital part of all work of this class, approaching a fixture, and of all helps the greatest toward the necessary frequent changes, is

#### The Groundwork of a Window,

or the permanent floor, shown in Figs. 6 and 7. They are not expensive, are always at hand, are readily cleaned, in fact are seldom, if ever, badly soiled, and save hours and days of getting ready. In the end they have paid for themselves over and again in time, in worry, in the frequency of their use, and in the saving of floor and table oil cloth and other expensive material. Fig. 6 shows a single color of light tinted tile in the prevailing shape, easily put in place, either to stay or

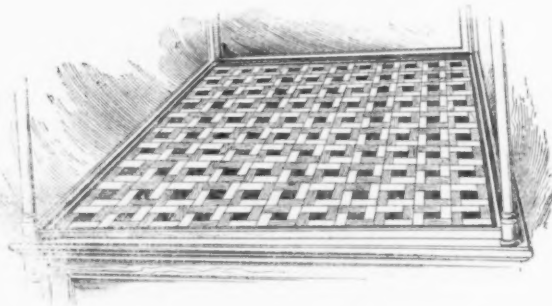


Fig. 7.—Parquetry Floor for Show Window.

to be changed as occasion offers. It is positively the prettiest floor ever put in a show window, and the original expense is small. The floor in Fig. 7 is a neat design, among many others, of parquetry or wood flooring, and can be placed to stay or for removal.

In two old windows in a building utterly devoid of beauty or style the writer saw these materials used, and never before or since has he seen anything so striking. How many of us would change or dress our windows much oftener if it were not for the bugaboo of having to get ready? There are many other simple and beautiful bases for windows, equally as applicable as these, and it is these helps and time savers we are all hunting.

#### Season Goods Yield Best Returns.

The best returns in window displays come from season goods, is an almost universal verdict, and great care should be taken that as nearly as possible it be made the rule in the store to display these. There are novelties or occasional drives that may prove the exception, but buyers are constantly on the lookout for goods in season, and they are looking just as hard for the prices,

SKATE SIZES ADAPTED TO SHOES											
Shoes No	1 or 1½	2 or 2½	3 or 3½	4 or 4½	5	6 or 7	8 or 9	10	10½ or 11		
Skates No	8	8½	9	9½	10	10½	11	11½	12		

Fig. 8.—Comparative Table of Shoe and Skate Sizes.

which in every case should be attached to the goods shown. If it is seeding time, then make a window of Bulk Seeds, Lawn Grasses, Bulbs, &c., and another one of all the tools that go with planting, gardening and harvesting them.

If the season is at hand, give them Skates and Sleds, give them Skates of all kinds, put half a dozen on "put by" shoes, showing their appearance when on the foot.

Give a table of Skate sizes and shoe sizes, a comparative table like Fig. 8 printed in good sized numbers on large cardboard and set on an easel well to the front. These little helps do a wonderful lot toward their own selling of the goods, and again the numerous questions are answered before the asking.

**Originality.**

Originality in window dressing is great capital, when possessed by a member of the firm or an employee, and it is a matter of surprise how many employees develop



Fig. 9.—Old Moss Covered Boards Taken from the Field and Made into an Attractive Window Rack with the Use of Old Trace Chains and 60d. Spikes Passed through the Links as Supports.

it, if given the opportunity. One of the most striking windows within the writer's recollection (Fig. 9) was made up largely, as to hangings and shelf work, of old moss-covered boards taken from country fences, and these supported as shelves with rusty Trace and Plow Chains, and rusty Spikes slipped in the links of Chain to hold the boards, no attempt whatever being made to remove nature's dressing.

Another, shown in Fig. 10, largely made up of the old-time stake and rided fence built just as on the farm, was part of a farmers' window. Simplicity is a part of true originality, and the above in part describes it as well as chapters could. The

**Employee in Every Store**

should be given the opportunity for development in this class of work. It is hard to tell what a man or boy has in him until given a chance, and the surprises are great and many where absolutely nothing was looked for.

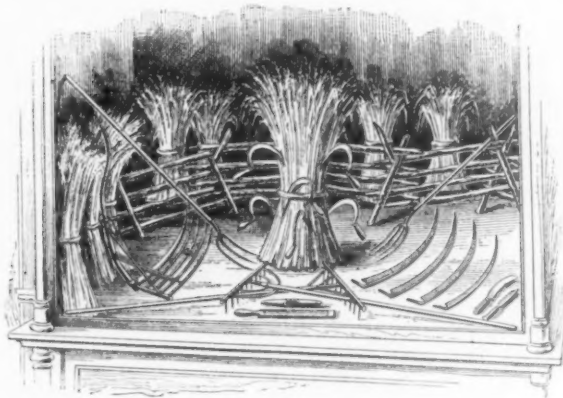


Fig. 10.—Window Showing Miniature Stake and Rided Fence. The Rails Are Made of an Old Original Rail Split Up. Sheaves of Grain Add to the Effect and Help Display the Harvesting Tools.

His ideas may be way ahead of any you may have on the subject, and his value to you increased tenfold. In his efforts to please he will work much harder than you will consent to. An occasional diffident employee hesitates to make the attempt, but we have always found him, with a little encouragement, ready to make the effort, and seldom have we seen one fail. It is due him

that he be drawn out in this as well as other lines, and we know of no better way to utilize him than by offering him the privilege, for so he will consider it.

**The Window and the Newspaper.**

Window display and local advertising should dovetail together, the one be a dependent part of the other.

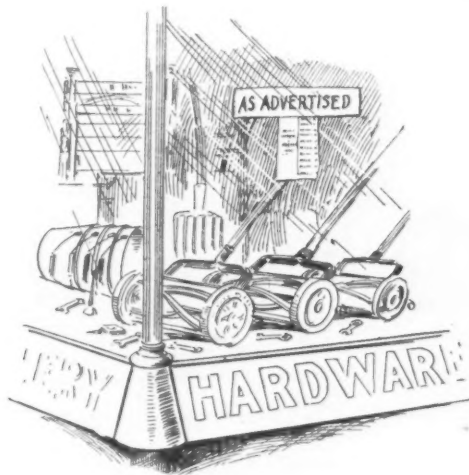


Fig. 11.—Window Containing Goods Advertised in Local Paper, with the Advertisement Clipped and Pasted on the Glass, with Sign, "As Advertised."

The reader invariably looks for verification of your statement, and nowhere else is he so likely to look for it as in your own show windows. If you have said in your daily or weekly something like this:

<b>Lawn Mowers</b>	<b>That Cut !</b>			
	<b>50 NEW ONES,</b>			
	12	14	16	18 in.
	\$2.50	\$3.00	\$3.50	\$4.00
<b>Will you try one ?</b>				

OR

<b>New Stock Wringers</b>	<b>Solid White Rolls,</b>
	Warranted 2 years.
	<b>Ball Bearing—</b>
	Price this week <b>\$2 75</b>
<b>See our window.</b>	

then now is the time, and before the reader has a chance to be disappointed, to have your windows alive with Lawn Mowers and Wringers—each one priced in plain

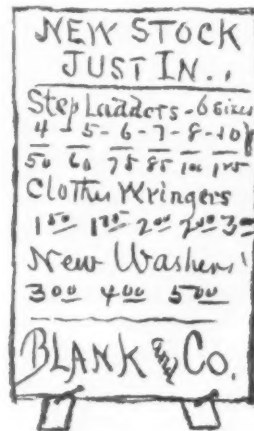


Fig. 12.—Placard on Easel.

figures, following out every word of the ad., and to that extent that with the first issue of the paper the ads. may be clipped and pasted on inside of window, with addi-



tional "As Advertised," if so desired, as illustrated in Fig. 11. And so it should be with everything else. The show window and the advertising should be part and parcel of each other. People have learned to associate them so, and watch for them.

#### Avoid Overcrowding.

The overcrowding of windows is a great mistake, and frequently spoils entirely displays that might otherwise be very attractive. It is a fault to be avoided beyond

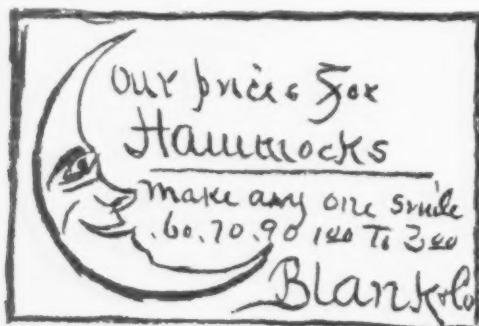


Fig. 13.—Placard Suitable for Summer Display.

all others. People know there are other goods in the store and do not expect to see all of them in your window. It is bad where goods are priced or where they are not, and as all goods shown should bear price cards, it is always bad.

Try a crowded, unpriced window for a week (if you feel you can afford the experiment), and the same window with just enough goods in it, all plainly marked,



Fig. 14.—Placard for a Gun and Ammunition Window.

for a day, and note the results. It is comforting that the man who crowds a show window in these days belongs largely to the class who fear the effect of prices in plain figures on their enterprising competitor, who is probably attending strictly to his own business.

#### Signs and Price Cards.

The clever man in the store with a brush, or a crayon, and there is one in nearly every store, can contribute wonderfully to the show window attractions,



Fig. 15.—Target from Rifle Shooting Contest.

and can have ready for use at any time, in connection with the goods shown, a series of placards or sketches that will stop more people than any arrangement of goods. The writer submits some samples in the rough, Figs. 12, 13 and 14. These can be varied and added to for each class of goods shown. The heavy cardboard

used can be had of any paper house, measuring 22 x 28 inches.

In the sporting or hunting season it is a good idea to have a series of trials at targets, both for a small prize and for your own show window decoration. One of these targets is shown in Fig. 15, and we assure you when a lot of them are placed in your window, with names of parties making the score, they will prove a great drawing card. In nearly every store the record



## A FRESH KEG TAPPED EVERY DAY

Fig. 16.—A Keg of Nails.

can be made in a rear room, or at the side of your business room, and should be furnished from your own stock of Sporting Rifles.

#### Figures and Arrangement.

Suggestions to employees of ingenious figures, or a test of lay figure construction, or striking arrangement of goods, is often productive of talk concerning your store, better and more lasting than pages of ordinary advertising. As nearly as possible they should bear



Fig. 17.—Quaker Made of Binder Twine.

connection with the goods shown, or in time will lose their value.

A sketch, Fig. 16, is submitted of the tapping of a keg of Nails, and we assure you while this was a part of the window display it was talked about for long after it was removed. It might be well to explain that the "flowing" Nails are tied together with invisible Wire.

The Quaker looking friend shown in Fig. 17 is the

work of the same employee, who originated it as a full sized Binder Twine man, made entirely of the 5-pound balls of Sisal Twine, and seated in an arm chair surrounded by bales and balls of twine. He is also the author of a clever Bicycle, constructed of Circular Saws, small Chains, Pans and "Monkey Wrench" pedals. These things take much work, and too much valuable time can be given them, but as an occasional "flyer" they are all right.

The whole subject of window dressing might make a book, and yet for all practical purposes can be summed up in

#### A Series of Suggestions,

applicable to all stores, and perhaps to be borne in mind at all times. They may have been given on occasion in some of your numerous published articles on the subject, but will bear repeating, and are as follows:

1. Use inclosed windows where possible; this is for the protection of goods shown and to prevent pilfering.
2. Whatever line of goods are shown should be priced in plain figures; many articles are sold in this way and no expense attaches.
3. Have show window floors always ready and fixtures near at hand; avoiding the getting ready for each change.
4. Simplicity, originality and ingenuity are the stocks in hand for window dressing.
5. Avoid overcrowding beyond all else; nothing takes away so much from an intended clever exhibit.
6. Many goods of a kind are much to be preferred to many kinds of goods.
7. All goods priced in plain figures is the silent salesman who works at all hours of the day and night.
8. Season stock and frequent changes in the goods keep the public interested in your store.
9. Window display should confirm all features of your advertising.
10. Give employees the chance to do more with your show windows than you have ever been able to do.

It would seem to the writer that if it were possible to bear in mind the above, in a general way, we could hardly go astray in the making of an attractive window display.

### AMONG THE HARDWARE TRADE.

Sandmeier & Vennekolt have succeeded H. P. North in the Hardware, Stove and Electrical Goods business in Waterville, Minn.

N. W. Deering is successor to N. W. Deering & Son, Quincy, Fla., dealers in Hardware, Stoves, Agricultural Implements, Sporting Goods, &c.

Orrin H. Tubbs has disposed of his Hardware and Tinware business in Bolton, N. Y., to Tubbs, Taylor & Co.

A. Rosenberg has lately opened up in business at Gardner, Mass., carrying a line embracing Shelf Hardware, Tinware, Wooden Ware, Kitchen Furnishings, Agricultural Implements, Paints, Oils, &c. His store is 23 x 79 feet in dimensions, and is new throughout. It is furnished with shelf boxes with green fronts, which are referred to as setting off samples to good advantage.

H. A. Ramsdell of Canova, S. D., on account of ill health has disposed of his Hardware and Stove stock to W. S. Breneman, who will continue at the old stand. The new proprietor has added a complete tin shop and also a line of groceries.

T. A. Hausmann has purchased E. H. Story's interest in the Hardware business in Bucklin, Mo.

W. H. Cook is successor to R. B. Martin in the Hardware and general merchandise business in Akron, Mich.

Briggs-Centers Hardware Company, Neosho, Mo., are successors to E. Skewes & Co., in the wholesale and retail business in Shelf and Heavy Hardware, Stoves and Tinware, Blacksmith Supplies, Sewer Pipe, Plumbing Supplies, &c. They are extending their present brick building 54 feet, making when completed an establishment 40 x 140 feet, two floors and basement.

Zager & Denton, Panora, Iowa, have disposed of their Hardware and Stove business to H. C. Ballard.

George S. Wilson of Elliston, Iowa, has opened a new store in Berlin, Iowa, handling Hardware and Agricultural Implements.

The Hardware Building Company of Sioux City, Iowa, have contracted for the erection of a warehouse, 100 x 150 feet, six stories and basement, to be occupied by Knapp & Spencer Company, wholesale Hardware, under lease for term of ten years. The building will probably be ready for occupancy by November 1 next.

J. H. Brewster's stock of Builders' Hardware, Stoves, Tinware, &c., Lisbon Falls, Maine, was entirely destroyed by fire a short time since.

J. B. Jewell, Estherville, Iowa, has disposed of his business to the Estherville Hardware & Implement Company, who are also successors to J. P. Anderson & Co., dealers in Farm Implements, coal, &c.

S. D. Farr has succeeded the Hardware firm of E. S. & S. D. Farr, Bristol, Vt. Mr. Farr, who is now sole owner, has been connected with the business under the styles of Drake, Farr & Co. and E. S. & S. D. Farr since the spring of 1869.

Henricks & Peterson is the style of a new firm who have just commenced business in Guthrie, O. T. The line of goods handled by them comprises Shelf and Heavy Hardware, Tinware, Enameled Ware, &c.

Hardware merchant J. K. Milligan has purchased Chas. B. Harner's interest in the firm of Nichols & Harner, Bellefontaine, Ohio, and the new firm, Nichols & Milligan, will consolidate the two stocks and move the Nichols & Harner stock to the store occupied by Mr. Milligan, which has lately been very much improved by putting in a new front and providing for a very large show window with side entrance.

Richards & Conover Hardware Company, Kansas City, Mo., have in course of erection a large new brick warehouse, three stories, with railroad switch facilities.

T. O. Hunter has bought the Hardware, Stove and Sporting Goods business of W. G. Corey in Bowbells, N. D.

Pioneer Hardware Company, C. M. Poulson, proprietor, have succeeded L. K. Slawson in the Hardware business in Watertown, S. D.

Daniel Rose and Dayton Johnson have purchased the business of the late Laven P. Jones, Haverstraw, N. Y., and will continue it under the style of Rose & Johnson.

D. C. Purdy & Sons is the style of a new firm at Highland Park, Ill. Their line consists of Hardware, Stoves, Furnaces, Sporting Goods, House Furnishing Goods, Bicycles, Automobiles, &c.

J. T. Johnson, wholesale and retail Hardware, House Furnishing Goods, Blacksmiths' Supplies, Sporting Goods, &c., Rondout, N. Y., suffered a slight loss from fire a short time since. The damage was mostly by water, and was fully covered by insurance.

A recent fire inflicted about \$10,000 damage on the establishment of the Delta Hardware Company, Escanaba, Mich., wholesale and retail dealers in Shelf and Heavy Hardware, Stoves and Tinware. The loss was fully covered by insurance, which was quickly and sat



isfactorily adjusted. The company were not obliged to close their doors to the trade, as they occupy a double store, and one side only was damaged.

### MISCELLANEOUS NOTES.

#### Dixon's Graphite Brushes.

Joseph Dixon Crucible Company, Jersey City, N. J., and 68 Reade street, New York, have just begun the manufacture of Dixon's perfected graphite brushes for motors, dynamos and generators. This lubricating device is a cube of graphite made in a great variety of sizes and dimensions. They issue a booklet of 16 pages, giving the three measurements of each size suitable for the electrical apparatus of 14 representative makers, one of which use 81 different brushes, varying in size from  $\frac{1}{4} \times \frac{1}{4} \times 1$  to  $1\frac{1}{8} \times 2 \times 4$  inches.

#### The American Corn and Fodder Shock Compressor.

J. B. Hughes, Greensburg, Ind., manufacturer, who has been heretofore offering this device in cast metal, will in future make it from stamped steel, producing a lighter, handsomer and stronger shock compressor than heretofore.

#### The Standard Refrigerator Fastener.

The accompanying cut shows a refrigerator door fastener, put on the market by the Dent Hardware Company, Fullerton, Pa. It is remarked that the most prom-



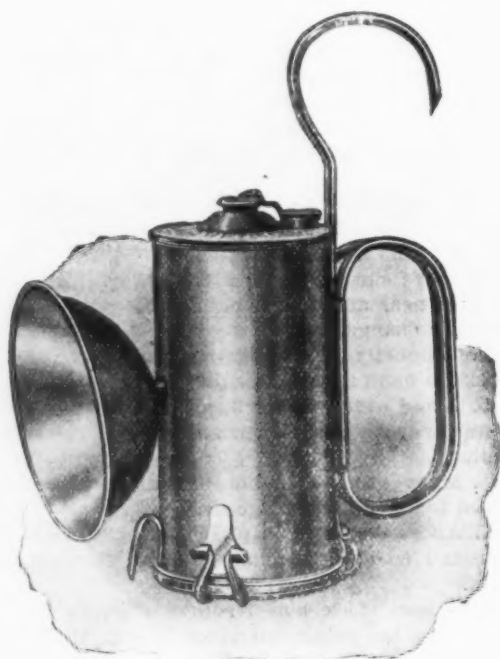
*The Standard Refrigerator Fastener.*

inent feature of the fastener is the pivoting of the latch or lever in the plate, that in the act of binding the door to its seat, strain on the pin forming the pivot is removed; the keeper and other parts of the latch being so made that when opening the door and before disengagement of the latch from the keeper the door is pried open by the movements of the latch within the keeper. The fastener is referred to as self locking and is made of tough metal. It is furnished in six sizes, in galvanized malleable iron, polished brass and nickel plated. The various sizes are designed for use on refrigerator doors, from those of family size to the largest refrigerators.

#### Baldwin Acetylene Mine Lamp.

A. H. Funke, 101 Duane street, New York, has recently put on the market the Baldwin acetylene miners' lamp, as here illustrated, which in construction is an adaptation of his Full Moon bicycle lamp. It is designed principally for use in coal mining, and is particularly useful in surveying. The curved pointed wire under the reflector gives the center of the flame in running lines, &c., in the mine. When looked at through the surveying instruments, the flame, pencil-like in appearance,

gives certainty as to the exact point. The surveying pole can be seen distinctly for a long distance when the light is thrown upon it. At the back of the lamp are two swinging oval handles, and a hook which revolves laterally. The hook forms a handle with which to carry it, and also allows of the lamp being hung up in the mine or on the person at will. There is no smoke or odor, and the strong, brilliant white light, it is stated, makes possible examinations 50 feet distant. One charge of carbide and water lasts four hours, costing less than 2 cents, and it can be quickly recharged. The carbide is held

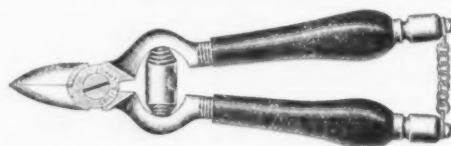


*Baldwin Acetylene Mine Lamp.*

in a removable inner chamber fast to the bottom, and held by three eccentric clamps. Water is introduced above and regulated by a movable indicator. The reflector has no glass, and the round flame is projected horizontally through a brass burner an inch or more in length, according to the amount of water fed to the carbide. The lamp is very simple, is made of nicked brass, weighs 9 ounces, and has been tested for several seasons for other purposes.

#### Handled Nail Nipper.

Graef & Schmidt, 107 Chambers street, New York, have just put on the market under the Twins brand of J. A. Henckels, Solingen, Germany, for whom they are sole selling agents for the United States and Canada, a new style of nail nipper, as here illustrated. The handles are variously made in jet black horn and white celluloid, samples also having been made with mother of pearl handles, which, however, are much more ex-



*Handled Nail Nipper with Volute Spring.*

pensive owing to the large diameter of pearl required. Nippers with the pearl handles are not carried in stock, but importation orders will be taken. The nippers are made of fine tool steel, have screw joints so that the parts can be readily separated for sharpening if necessary and are finely polished. The flat ribbon like spring is of the volute type, and the ends of the handles, when not in use, are held together by a chain fastening, which causes no interference when operating the nipper.

### Improved New Departure Coaster Brake.

The New Departure Bell Company, Bristol, Conn., and P. & F. Corbin, New Britain, Conn., are marketing a new form of the New Departure coaster brake, as here illustrated. A marked feature over its predecessors is the interior mechanism, particularly with regard to disassembling and reassembling the parts when cleaning it. Aside from cleaning the parts or removing the wheel from frame, it can be taken apart and put together in a minute or two without expert knowledge. What makes

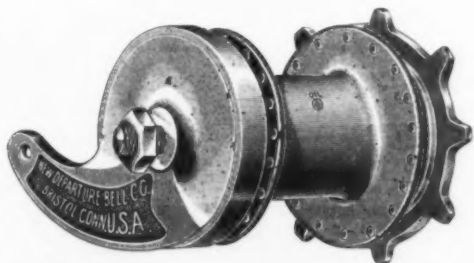


Fig. 1.—New Departure Coaster Brake, Complete.

rapidity possible is the fact that the balls are held in containers from which any or all of the balls can be pushed with a little pressure, although this is not necessary in cleaning, and that the constituent parts are so made that they can go together but one way, the only tool required being a flat steel one-piece wrench packed with the brake. No attention is required beyond oiling, for which purpose there are two covered oil holes, one in the hub and one in the brake cover, not shown in cut. Fig. 1 shows the hub complete ready for lacing into the wheel. Fig. 2 is the hub barrel, which is provided with a ball cup in each end and a brake drum, all

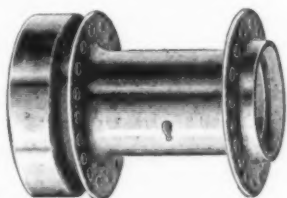


Fig. 2.—Hub, Ball Cups and Brake Drum.

formed from a single solid piece of steel. There are no parts to be screwed in, all slipping easily into position by hand and held in place by the adjusting cone, shown at the right of Fig. 3, illustrating the axle, which is of the usual construction, a straight rod with screw threads at each end. Fig. 4 represents the sprocket and driver. The driver, to which the sprocket is attached, projects within the hub and operates the clutching device. When coasting and holding the feet stationary this part, through its engagement with the clutch seen in Fig. 5, clutches the brake and a slight backward pressure expands the brake rim in the hub drum, retarding the bicycle in exact proportion to the back pressure exerted. Fig. 5, the clutch, has an internal clutching surface which engages with the brake seen in Fig. 6, following a backward movement of the pedals; pedaling



Fig. 3.—Axle and Adjusting Cone.

forward causes the outer clutching surface to engage the hub barrel and propel the bicycle. Fig. 6 is the brake and its actuator, which is operated by the clutch seen in the illustration. The brake is composed of an open or split steel ring, which is expanded into fractional contact with the brake drum seen at the left of Fig. 2. The parts are hardened steel and of a strength making them practically indestructible. No fiber, leather or other material softer than steel is used. Fig. 7, detach-

ble sprockets, provide for the fitting of the hub with any size, thickness or pitch of sprocket, and also allow for  $1\frac{1}{2}$ ,  $1\frac{3}{8}$  or  $1\frac{1}{4}$  inch chain line in connection with the same hub. In Fig. 7 the center sprocket provides for a  $1\frac{3}{8}$ -inch chain line. The sprocket at the left is suitable for a  $1\frac{1}{2}$ -inch chain line, while the same

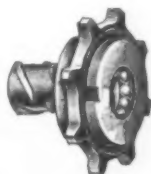


Fig. 4.—Sprocket and Driver.



Fig. 5.—Clutch.

sprocket reversed gives a  $1\frac{1}{4}$ -inch chain line. This system enables the dealer to meet all requirements by carrying an assortment of sprockets, which are exchangeable at any time, and yet have a comparatively small number of hubs. Fig. 8 is a sectional view of the coaster and brake complete. The part E is rigidly connected to the sprocket G and is connected by spiral keys with the clutch sleeve D. The forward motion of the sprocket clutches the hub; the backward motion the brake. The

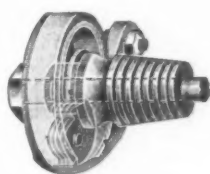


Fig. 6.—Brake and Actuator.

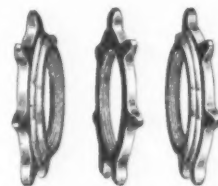


Fig. 7.—Detachable Sprockets.

balls are  $\frac{3}{8}$  inch in size, and all are mounted in containers to facilitate handling. All the bearings are absolutely free and are adjusted by the cone I. The coaster and brake is guaranteed for one year, and in the event of repairs they will be made free of charge, provided the blank guarantee wrapped around each hub is properly filled out and forwarded to the manufacturer by the user when he buys it. A feature of this coaster is the application of the Security cyclometer, made by the New Departure Bell Company, by means of which the distance coasted or ridden without pedaling is ascertained. The cyclometer is fastened to the hub and revolves with it, no record being made while pedaling forward, but as soon as the wheel is running free and

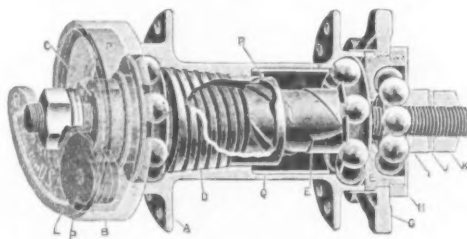


Fig. 8.—Sectional View of Coaster Brake.

the rear sprocket is at rest a trip on the dust cap turns the star wheel of cyclometer at each revolution. If so ordered a dust cap with trip will be sent with coaster instead of the regular cap, without extra charge. A page advertisement of the brake also appears in another part of this issue.

Sargent & Co., 149-153 Leonard street, New York, for the purpose of drawing the attention of the public to their Gem Food Chopper, issue for dealers a set of three illustrated display cards  $17\frac{1}{2} \times 9\frac{1}{2}$  inches. On both sides of the card are printed terse sentences in large type to catch the eye of housekeepers and others, one of which is as follows: "It won't chop wood, but Sargent's Gem Food Chopper will chop raw meat, cooked meat, vegetables of all kinds, fruit, crackers, bread, cheese, nuts, figs and other foods."



### The Weaver Match Safe.

The Weaver Novelty Company, Detroit, Mich., are offering the match safe herewith shown. The feature of the device is that it feeds one match at a time, which,



*The Weaver Match Safe.*

the manufacturers remark, it does perfectly. Among the points of excellence the following are mentioned: That it will never wear out, and cannot get out of order; that it is fire proof, and protects matches from dampness, children or mice, and that it has no springs or intricate devices, its working parts being simple, sure and positive. The device is made of cast iron, finished in oxidized copper plate. It is 5 inches high, 3½ inches wide, and 3 inches deep, weighing 3 pounds. It will hold two ordinary sized boxes of matches. It is designed for use in the home, on the office desk or on the counter, and is particularly economical when used in cigar stores, and such other places where the public expect to be provided with matches.

### The Hiles Improved Ice Breaker.

An illustration is herewith given of an improved ice breaker manufactured by C. A. Hiles & Co., 336-338 Car-



*The Hiles Improved Ice Breaker.*

roll avenue, Chicago, Ill. It consists of a strong iron casting, well galvanized, having a perforated center with numerous sharp projections, on which the block of ice rests. The new feature is the construction of the rim, which as now made fits over the top of a pail, so

as to prevent any ice flying out at the side, and causing annoyance by the pieces melting on the surrounding floor. This is accomplished by making the rim with double walls, the interior wall being of cast iron, and the outside wall of galvanized sheet band, the space between them being wide enough to allow the device to be used in pails of different sizes. With the breaker ice can be broken of uniform size for ice cream freezers and for table use. The broken pieces are ¾ inch or smaller in size. A hickory maul is furnished with each breaker. The manufacturers state that a pailful of ice can be broken in one minute.

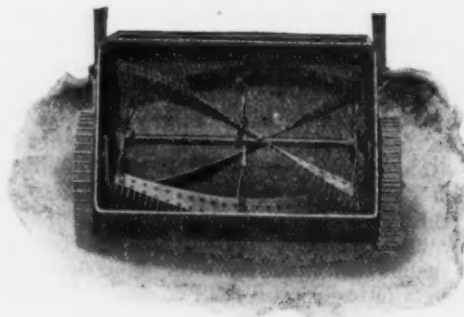
### The Finley Lawn Rake, 1901 Model.

The Finley Lawn Rake Company, Joliet, Ill., are offering the 1901 model of lawn rake, shown herewith. In Fig. 1 the rake is shown as used, while it is illustrated inverted in Fig. 2, showing its construction. In principle the rake is not unlike a carpet sweeper, with steel teeth in the blades, where the brush comes in a



*Fig. 1.—Finley Rotary Lawn Rake.*

sweeper. The various parts of the rake are referred to as being of the best materials, the teeth in the blades being of the best quality of steel, strongly riveted, and practically indestructible. The rake is steel throughout, with the exception of the wooden push bars. Every part, it is remarked, is riveted where possible. It is explained that the rotary movement of the blades causes a blast or suction in revolving, and that loose grass, leaves, twigs and any litter are forced back into the basket, which, when filled, is easily removed, so that the



*Fig. 2.—The Finley Lawn Rake Inverted.*

contents may be dumped, ready to carry away. The manufacturers state that the rake pushes so easily that a child can run it; that after a lawn is cut and then gone over with the rake it is as clean as a carpet; that the grass is left standing up; and that any creeping weeds or crab grass are also raised up, and by a second cut of the mower destroyed.

H. O. Amundson has lately purchased the Hardware, Stove, Farm Implement and Sporting Goods stock of Mousee, Wagener & Alton, Alexandria, Minn. Mr. Amundson has materially enlarged the store and made a number of improvements in the interior with a view to making it more attractive and convenient.

